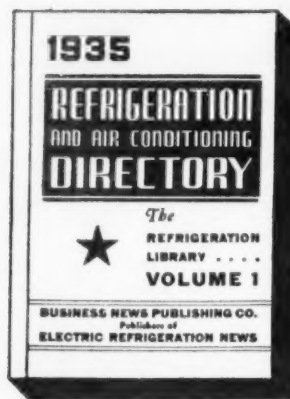


Get these two books now

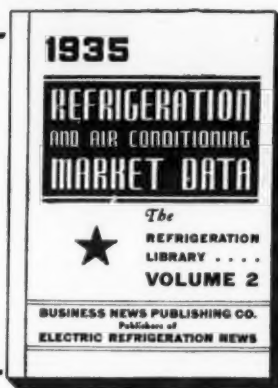


380 Pages—\$3.00

The **DIRECTORY** is the industry reference book for all known sources of supply for refrigeration and air-conditioning products. Next edition will be published July 1, 1936.

Every sales executive should have the **MARKET DATA BOOK** for its compilation of sales methods and sales figures recording industry development to date. Next edition to be published Sept. 1, 1936.

Combination Price for Both Books

\$5.00

304 Pages—\$3.00

New books in preparation

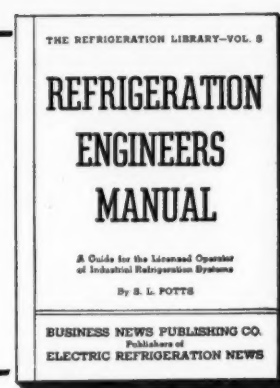


Approx. 300 Pages—\$3.00

The Refrigeration and Air Conditioning Specifications book will contain detailed comparative data which every dealer, salesman, and service man has been wanting. To be published March 1, 1936.

The Refrigeration Engineers Manual, written especially for the engineer in charge of industrial refrigeration systems, is now running serially in the News. To be published in book form May 1, 1936.

Combination Price for Both Books

\$5.00

Approx. 300 Pages—\$3.00

Off the press this month

Order Your Copy Now

Truly a master key to servicing problems. This manual includes the necessary instructions for servicing all the fundamental types of household systems.

Author K. M. Newcum has a background of wide experience with refrigeration service. He has been active in practical field work and has taught service courses in trade schools. His training has given him a direct and understandable approach to the problems of the operating service man. He has found a way to phrase the instructions for each operation so that they may be quickly grasped by the student. Many illustrations throughout the text help to make its meaning clear.

Detailed instructions for the servicing of more than a dozen "orphan makes" are also included.

The Master Service Manual is the ideal reference book for the busy man to use in meeting the problems which come up daily in the shop and while on outside jobs.

The Master Service Manual also makes an excellent text book for the student or apprentice, and a useful digest of refrigeration information for dealers and salesmen.

THE REFRIGERATION LIBRARY—VOL. 3

MASTER SERVICE MANUAL

WHAT TO DO and HOW TO DO IT
for all types of household systems

By K. M. NEWCUM

BUSINESS NEWS PUBLISHING CO.
Publishers of
ELECTRIC REFRIGERATION NEWS

Authorized Agents

The refrigeration supply jobbers listed below are authorized agents for the Master Service Manual and other publications of this company. They also have for sale at their retail counters the current issues of Electric Refrigeration News.

Aetna Supply Co. 407 E. 152nd St., New York.	The Harry Alter Co. 4611 N. Western Ave., Chicago.
McIntire Connector Co. 253 Jefferson St., Newark, N. J.	George Monjian Co. 360 East Grand Ave., Chicago.
Wm. M. Orr Co. 1230 Brighton Rd., Pittsburgh.	Refrigeration Equipment & Supply Co. 5733 W. Chicago Ave., Chicago.
Henry V. Dick & Co. 514 Oates St., Charlotte, N. C.	W-M Refrigeration Co. 2468 N. Third St., Milwaukee.
United Refrigeration Supply Co. 941 Madison Ave., Memphis.	C. L. Percival Co. 11th & Cherry Sts. Des Moines, Iowa.
Debes & Co. 1249 E. 105th St., Cleveland.	The Harry Alter Co. 2315 Washington Ave. St. Louis, Mo.
W. C. DuComb Co., Inc. 6335 E. Palmer St., Detroit.	The Spangler Co., Inc. 3331 Market St., St. Louis, Mo.
J. M. Oberc, Inc. 1203 Stanley St., Detroit, Mich.	Burnstein-Applebee Co. 1012 McGee St., Kansas City.
Young Supply Co. 1050 W. Baltimore, Detroit.	D. C. Lingo Co. 306 M & M Bldg., Houston.
H. J. Schroeder Co. 1202 S. Calhoun St. Ft. Wayne, Ind.	Refrigeration Service, Inc. 3109 Beverly Blvd. Los Angeles, Calif.
Airo Supply Co. 410 N. Wells St., Chicago, Ill.	California Refrigerator Co. 1077 Mission St. San Francisco, Calif.
The Harry Alter Co. 5217 W. Madison St., Chicago.	F. C. Lovelock, Ltd. 235 Clarence St. Sydney, Australia.
The Harry Alter Co. 1728 S. Michigan Ave., Chicago.	

Approx. 400 pages—Price \$3.00 per copy

The Master Service Manual is offered in combination with a one-year subscription to Electric Refrigeration News — **\$5.00**

Use this Coupon

Date.....

Business News Publishing Co.
5229 Cass Ave., Detroit, Mich.

Enclosed is \$..... Please send me:

- ☐ Weekly issues of Electric Refrigeration News for 1 year.
- ☐ 1935 Refrigeration & Air Conditioning Directory.
- ☐ 1935 Refrigeration & Air Conditioning Market Data Book.
- ☐ Master Service Manual.
- ☐ Refrigeration & Air Conditioning Specifications. (To be published March 1, 1936.)
- ☐ Refrigeration Engineers Manual. (To be published May 1, 1936.)

Name

Attention or In care of

Street City..... State.....

Remarks

(Please indicate products sold or principal line of business.)

1-8-36

Combination Rates

(Effective Jan. 1, 1936)

U. S. and Possessions And Pan-American Postal Union Countries	Price for books only postpaid	Price of books in combination with a one-year subscription to Electric Refrigeration News
Any 1 book	\$3.00	\$5.00
Any 2 books	5.00	6.50
Any 3 books	6.50	8.00
Any 4 books	7.50	9.00
All 5 books	8.50	10.00
All Other Countries	Price for books only postpaid	Price of books in combination with a one-year subscription to Electric Refrigeration News
Any 1 book	\$3.50	\$7.00
Any 2 books	5.50	9.00
Any 3 books	7.00	10.00
Any 4 books	8.00	11.00
All 5 books	9.00	12.00

Group Order Rates & Quantity Prices

Many companies in all branches of the industry have indicated their interest in group subscriptions to Electric Refrigeration News, and quantity prices for the Master Service Manual and other books.

The group rates below apply only to paid-in-advance orders. Charge orders are billed at the single-subscription rate, regardless of number. Papers or books will be mailed to individual addresses upon request.

Electric Refrigeration News

United States and Possessions, Canada, and Pan-American Postal Union Countries	All other Countries
1 subscription	\$5.00
5 or more each	4.75
10 or more each	4.50
20 or more each	4.25
50 or more each	4.00
75 or more each	3.75
100 or more each	3.50

Quantity Prices on Books

United States and Possessions, and Pan-American Postal Union Countries	All other Countries
1 copy	\$3.50
5 or more each	3.25
10 or more each	3.00
20 or more each	2.75
50 or more each	2.50
75 or more each	2.25
100 or more each	2.00

REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS.

VOL. 17, No. 3, SERIAL NO. 356
ISSUED EVERY WEDNESDAYEntered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, JANUARY 15, 1936

Copyright, 1936, by
Business News Pub. Co.THREE DOLLARS PER YEAR
TEN CENTS PER COPYEditor Stops at Stewart-Warner,
Sparton and Fairbanks-Morse on
First Week of 'World Series' TripSparton Distributors to Merchandise Accessories;
S-W Increases 'Get-at-Able' Space in Cabinet;
F-M Changes Status of Appliance Division

By George F. Taubeneck

CHICAGO—So far on this trip the air has been so filled with snow and news that we haven't traveled very far. And the news is as exciting as the snow is irritating. First stop after the Kelvinator plant in Detroit (and after battling an Antarctic blizzard) was Jackson, Mich., where Capt. William Sparks, Harry Sparks, E. T. H. Hutchinson, Guy Core, and A. T. Haugh had just finished showing the 1936 Spartons to their distributors.

Most interesting news: Sparton dealers and distributors will become accessory merchandisers; and it will be made easy for the purchaser of a standard model to buy any of the special features of the deluxe models. New gadget: Baskadraper.

Stewart-Warner's big Chicago plant was the next stop, and there Frank Hiter, John Ditzell, H. H. Kunkle, Fred Cross, and Gus Treffeisen proudly showed us the 1936 Stewart-Warner lines, which Charley D'Olive has completely redesigned.

Summarized briefly (we'll tell more later) these are among the most

Editor's Note—Details of Stewart-Warner's 1936 refrigerator models will be found on page 2, Fairbanks-Morse on page 2, and Sparton on page 4.

easily "get-at-able" refrigerators we've ever seen, with interior arrangements so flexible that the housewife can practically design—and remake—her own refrigerator to suit herself.

Most novel Stewart-Warner feature: an illuminated 11-point cold control. Most practical feature: the Sav-a-Step, which fits as neatly and is as easily removable as a set of false teeth (but is a lot more convenient!).

At Fairbanks-Morse we found big news:

(1) Fairbanks-Morse Home Appliances, Inc., is to be dissolved; and the manufacture and merchandising of F-M electric refrigerators, radios, and washing machines is to become a division of the parent company, Fairbanks, Morse & Co., instead of a wholly-owned subsidiary. Mortimer Frankel and W. Paul Jones continue in charge.

(2) This new division is to move from 430 South Green St., Chicago, to the big Fairbanks-Morse plant in Indianapolis—both offices and factory.

Dry Goods Group Opens
Convention Jan. 20

NEW YORK CITY—Possibilities for greater department store business this year and problems that confront department stores at the present time will be discussed by the country's best known merchandisers at the Silver Jubilee convention of the National Retail Dry Goods Association, to be held Jan. 20 through 24 at the Hotel Pennsylvania here.

The five-day meeting will be packed with sessions devoted to every type of merchandising, but the one that will probably interest electrical appliance merchandisers most is the one Wednesday morning devoted to

Detroit Lubricator Forms
Refrigeration Division

DETROIT—Manufacture and sale of "Detroit" controls for electric refrigeration equipment will now be carried on by a separate division of the Detroit Lubricator Co.

Just established by the company is a new Refrigeration Division which will supervise the production and sales of the controls which the company has manufactured for a number of years.

Irving J. Knudson has been placed in charge of the sales of all refrigeration and air-conditioning control apparatus, and D. D. Wile has been appointed chief engineer of refrigeration and air conditioning.

Specifications

Published on page 20 of this issue are key specifications of the four new 1936 electric refrigerator lines announced in this issue—Fairbanks-Morse, Leonard, Sparton, and Stewart-Warner—and those of two makes published in previous issues, General Electric and Kelvinator.

These key specifications include data on food storage capacity, ice freezing capacity, shelf area, and other pertinent information.

These specifications will be filled out and those of other makes added at an early date.

Distributors See 1936
Crosley-Styled Cabinets
& New Washer Line

CINCINNATI—Crosley's stylishly designed 1936 refrigerators, the new radio models with the Auto-Expressionator and Bass Compensator, and Crosley's new line of "Savamaid" washers and ironers, were previewed by 250 Crosley distributors from all corners of the country at the company's convention here last week.

Details on the new refrigerator line have not been released at this time, but will be published in an early issue of ELECTRIC REFRIGERATION NEWS.

It is known, however, that all of the refrigerator models with but one exception have been adapted to a streamlined and sloped top design, with rounded front shoulders.

Application of automobile stamping methods are used in the cabinet construction, and expensive die stamping out the rounded and sloping top and back of the Shelves such as automobile makers stamp out fenders.

The Auto-Expressionator and Bass Compensator are twin inventions secretly developed during the past 17 months within the Crosley laboratory.

(Concluded on Page 4, Column 3)

Leonard Introduces New Models;
Design & Construction Changed;
Five-Year Service Plan FeaturedTemperature Indicator, Dry-Vegetable Drawer, and
Rearranging Shelf Are Other New Selling
Points in 'Hot Line'—Unit to Use Freon

By Phil B. Redeker

GRAND RAPIDS, Mich., Jan. 13—Four hundred Leonard distributors and the top ranking men of their organizations, gathered here in eager expectation for their first look at what has been heralded in Leonard's advance trade press advertising as a "sensational" refrigerator, were not disappointed today when Sales Manager R. I. Petrie unveiled a line of refrigerators replete

Sparton Distributors
Hear 1936 Plans

By T. T. Quinn

JACKSON, Mich.—Just finished with the most successful refrigeration season in their history, about 135 Sparton distributors and their salesmen met with officials of Sparks-Withington Co. in a two-day convention last Tuesday and Wednesday, to plan even more ambitious and optimistic accomplishments for 1936.

General Sales Manager A. T. Haugh ran off the convention in his usual good-humored manner, with the assistance of President William Sparks, General Manager Harry G. Sparks, Sales Manager E. T. H. Hutchinson, Advertising Manager Guy C. Core, Assistant Sales Manager Harley Wall, and Service Manager J. J. Lynch.

In line with Sparton's program to have distributors and salesmen familiarize themselves with their product's construction "from the ground up," conventioners were taken on a tour of the factories Tuesday morning.

Capt. William Sparks, just back from an eight-week trip through Europe, opened the convention.

Unemployment in Europe, he said, (Concluded on Page 4, Column 4)

with startling changes and innovations.

Number one of the changes is in the appearance of the refrigerator. A rugged type of construction with extra-heavy hardware and an unusually wide frontal area give the impression of sturdiness and massiveness. Beauty is attained by the sweeping vertical cabinet lines which curve into an arched top, the extra length door's curved top fitting flush with the top of the refrigerator.

Cabinets in the "L" series will have the Permalain exterior finish, and while here the distributors will be taken through the brand new addition to the Leonard plant where this finish is applied.

Mr. Petrie emphasized to the distributors that the virtues of the new models are more than "skin deep," and asserted that Leonard this year will make claims of a 40 per cent lower operating cost made possible by a new-type, seam-welded cabinet construction with 30 to 40 per cent more insulation than was used last year, plus changes in the compressor design.

Freon will be used as the refrigerant in the Leonard compressor this year, and units will be mounted in the top of the cabinet, instead of in the bottom, as heretofore.

The unit will carry a five-year service protection plan which will operate as follows: a one-year guarantee, plus a four-year warranty, for which the purchaser will pay an additional \$5.

All models in the two standard lines will have a temperature indicator, (Concluded on Page 7, Column 1)

McIntyre Is Appointed
Norge Vice President

DETROIT—George McIntyre of Newark has recently been appointed vice president of Norge Corp. in charge of national buyers' activities.

Having been associated with the Beneficial Management Corp. for a number of years, Mr. McIntyre will continue as officer and director of several corporations affiliated with or supervised by that company. He was formerly an officer of Commercial Credit Corp. and the Industrial Morris Bank.

Mr. McIntyre will also act in an advisory capacity on finance for the Norge distributive organization.

Leonard Ships 7,835 Units
In Final Quarter

DETROIT—Total shipments of electric refrigerators made by the Leonard Refrigerator Co. during the final quarter of last year, ending Dec. 31, 1935, were 7,835 units, compared with 4,389 units shipped in the same quarter of 1934, reports H. W. Burritt, vice president in charge of sales.

The final quarter shipments were almost double the number of units shipped in the previous quarter, ending Sept. 30, 1935. During December alone, Leonard shipped 7,257 units, as compared with 3,931 units shipped in the corresponding months of 1934.

Peirce-Phelps to Handle
Crosley Products

PHILADELPHIA—Peirce-Phelps, Inc., has taken over distribution of Crosley refrigerators and radios here.

The firm will serve dealers in eastern Pennsylvania, south Jersey, and Delaware, and will establish a branch office in Harrisburg to cover that section of the state.

Frigidaire Men Gather for Biggest Convention Since 1929

DAYTON, Jan. 13—The largest gathering of Frigidaire distributors, district managers, district sales managers, dealer supervisors, and installation and service managers since the old "Trip to Dayton" days prior to 1929 will converge upon the headquarters city of Frigidaire Corp. here tonight, for a four-day convention at which 1936 products will be previewed, the two factories inspected, and sales plans for the forthcoming 12 months outlined.

The convention will honor the dis-

trict representatives who week in and week out contact the nearly 6,000 dealer outlets which market Frigidaire household electric refrigerators, commercial refrigeration equipment, and unit air conditioners.

First of the four days of the convention period, Tuesday, Jan. 14, will see the entire group gathered at the Victory theater where a confidential preview of new products and the 1936 spring field sales convention will be held.

Tuesday night a banquet will be

held at which President E. G. Biechler will preside and Charles F. Kettering, vice president of General Motors in charge of research, and Richard H. Grant, vice president of General Motors in charge of sales, will be the principal speakers. Mr. Kettering and Mr. Grant are co-founders of the organization that now is Frigidaire.

On Wednesday, the visitors will be taken on a tour of General Motors in Dayton, passing the plants of Delco Products and Moraine Products divi-

(Concluded on Page 4, Column 5)

All Aboard for California and Points West



F. M. Cockrell and the staff of Electric Refrigeration News bid goodbye to Editor George F. Taubeneck last Wednesday as he started on a six-months trip to study export markets and represent the household branch of the industry at the World Congress of Refrigeration at The Hague next June.

IMPRESSIONS OF NEW MODELS AND SELLING PLANS OF STEWART-WARNER & FAIRBANKS-MORSE

BY GEORGE F. TAUBENECK
(CONTINUED FROM PAGE 1)

Stewart-Warner Big League Now

"We've thrown away the string ball and are ready to bat in the big league now," smiled Designer D'OLIVE when he demonstrated the new Stewart-Warner line.

Whereupon he sat us down in front of a Deluxe model, and proceeded to go through a dazzling display of hocus-pocus presto-chango rapid shifting of the interior shelf arrangements—proving that the housewife can rearrange the interior a dozen times a day, if need be, to satisfy her own whims, and to suit the kinds of food she may store therein at any particular time.

"Every distributor who has witnessed this demonstration, and the whole line, tells us that we have the most flexible refrigerators they have ever seen," asserted the proud Mr. D'Olive.

"Yes," chimed in Mr. HITER, "and to prove it they have signed enough orders to make January the biggest month—not just the biggest January—in Stewart-Warner refrigerator history."

Feature by Feature

To this observer, perhaps the most novel feature that Mr. D'Olive has incorporated into the new Stewart-Warner is an illuminated temperature control.

With considerable ingenuity Designer D'Olive has arranged the interior light so that it not only floods the whole food compartment with brightness, but also shines through the temperature control in such a manner as to give that instrument the appearance of self-luminosity. It looks very much like a lighted dial on a radio.

Two separate sets of positions are located on this dial—winter (cool) and summer (cold).

This illuminated dial, the electric light switch, and the control button form a cluster on the left of the control panel. Balancing this on the right is a chrome-and-enamel nameplate—an exact replica of the one on the cabinet door.

Exactly matching, and immediately below the control panel is the evaporator door (both are heavy brass, dull chrome finished, and give the appearance of massivity and solidity, in keeping with the rest of the box).

Right here is where that flexibility we spoke of comes in—the evaporator door can be switched in a few seconds by the housewife to open either to the right or left.

And now for Sav-a-Step. This is a shelf grouping which is a separate, portable unit. Big idea is to put in it all the things you need for breakfast—eggs, milk, butter, bacon, fruit, tomato juice, etc. Then in the morning you simply open the door, lift out Sav-a-Step, and carry it over to the kitchen table—and you have your breakfast material all in one trip.

This device also swings out smoothly on hinges of its own, so that you can get at food stored in the rear of the box more easily. Furthermore, if you like the shelves-in-or-on-door arrangement, Sav-a-Step can be snapped securely onto three chrome

sockets on the inside of the door.

Slid-a-Tray is provided as a handy place to put foods when the housewife is rearranging the contents of her refrigerator, or when she wants to get some foods out of the way so that she can reach others.

In instances of this sort, she merely pulls gently on a slot in the top edge of the door to the compressor compartment. As the bottom-hinged door tips forward, a diamond-grid metal tray appears, forming a solid rearranging shelf.

A rubber ice tray is standard equipment on Deluxe models, and a removable shelf is provided for double-depth trays. Larger models make 12 lbs. of ice in six trays; smaller models make 8 lbs. of ice in four trays. All have a wide glass chilling tray.

Top walls of the cabinet are welded together into one piece of heavy steel that enfolds the food chamber in a solid, unjointed housing.

The top, sides, and heavy, curved door are insulated with 3 in. of Balsam Wool. The slabs of Balsam Wool are compressed within a water-proof wrapper, fitted behind the steel exterior of the sides, and then sealed again in a second water-proof container.

All models, except those that have a porcelain exterior, are finished in Du Pont Dulux.

The hardware of the Deluxe models has a parallel line motif that blends with the modern design of the door.

The latch is concealed inside the trigger door handle so that the natural motion of pulling the door open releases the latch at the same time.

Other features include a sliding vegetable basket and a sliding vegetable freshener, diamond-grid shelves, tiltable shelf to permit tall bottle storage, centered porcelain evaporator, four-piece glass dish set on revolving base, and a twin-cylinder (except in smallest models) compressor of conventional design.

Fairbanks-Morse 'Demonstrate'

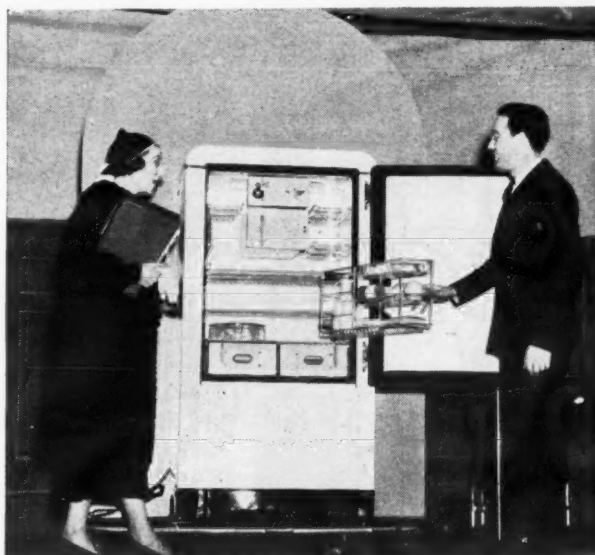
Conservador, winner of the blue ribbon at the National Inventors' Congress as the most useful household invention of 1935, is again the outstanding sales feature of the company's 1936 line. And "Demonstrate!" will be the theme song of all F-M's 1936 merchandising.

To help dealers do this Vice President W. Paul Jones, an avid student of the late great John H. Patterson's specialty selling technique, has devised what he calls "the answer to the canned sales talk"—a "15-star" presentation routine which enables the salesman to get his points across to the prospect in the most effective manner possible.

The way the "15-star" presentation works is this:

Each dealer will be supplied with a Demonstrator Book, containing the 15 outstanding features of the F-M line, each printed on a gummed sticker on which are stars of various colors.

As the salesman enumerates each feature, he pastes the corresponding "star" on the refrigerator door. When the presentation ends, the refrigerator



In the "deaf-and-dumb salesman" skit that scored a hit with Stewart-Warner distributors, Salesman "Jess Showit" doesn't say a word as he shows a prospect how back shelf space becomes front space when S-W's "Sav-a-Step" feature swings out. (2) A demonstration of how Sav-a-Step can be placed on refrigerator door.

door is literally covered with "stars," and the prospect is reminded of F-M features in a manner which is hard to overlook.

This plan, Mr. Jones believes, will permit the salesman to pack drama into his sales talk, without giving the presentation any flavor of the "canned" talk to which so many salesmen object.

"It packs the most powerful punch ever put into a piece of promotional material," Mr. Jones told distributors—and their applause indicated that they saw eye to eye with him.

The sales routine was outlined in a model skit put on by two members of the Fairbanks-Morse staff, the third of a series of skits acted out to show distributors the "how" of things. As the salesman went through his selling talk, he plastered the refrigerator door with "stars."

The Stars—One by One

First "star" was for beauty. The 1936 line of "C" models, in four sizes of from 4- to 6-cu. ft. capacities, features a new flow-curve beauty which eliminates sharp lines and angles without awkwardness, and is modern without being extreme. Front base of black lacquer is floor-level, with a low arch on the sides for cleaning.

Second feature of "star" rating is high-baked Dulux finish.

Third is the new touch-open "Automatic Doorman"—a chromium tubular bar, which, touched anywhere, opens the refrigerator door. A nudge is all that is needed to open it. Conservador is opened by pressing a little black button on the lower part of the bar.

Fourth feature (and fifth and sixth, too) is Conservador. Its first "star" is for the convenience itself, for "putting the back of the shelf up in front." Second star-winning asset is the added storage space which Conservador makes possible; third is for economy, which Conservador effects by eliminating "the penalty of the open door."

Star No. 7 goes to Fairbanks, Morse & Co., the company behind the product, for its 106 years of successful experience in the manufacturing business.

Eighth feature is the Fairbanks-Morse machine unit, a valve-in-head unit which, F-M engineers assert, permits greater efficiency and more economical operation under all conditions. Single-cylinder compressors are used in all units except the C-6-S, which has one of twin-cylinder design. The long life feature of the unit, due to its slow speed, is the ninth F-M feature.

Tenth is the finned evaporator unit, which enables more rapid absorption of heat in the refrigerator; faster freezing and cooling at less current cost; and the 11-point temperature selector, which permits fast freezing or leisurely cooling.

Star No. 11 goes to the fast freezing power of the evaporator unit, and its generous ice supply. Ample size cold shelves, in direct contact with ice trays, give faster freezing; and ice cubes are large size, 18 cubes to the tray.

The Conservador basket has been improved and made more easily removable, Feature No. 12. Only four supporting nuts are used this year, and these are easily loosened, so that the entire basket assembly may be taken off for cleaning in a few minutes.

Quiet operation is the thirteenth feature, for three reasons: (1) power units are precision built and dynamically balanced, running smoothly and quietly; (2) entire unit rests on steel

springs, cushioned in rubber, cutting out vibration noises; (3) the unit is enclosed in a "sound-proofed" compartment which absorbs noise, due to its scientific construction.

Insulation is Feature 14, again an economy point. F-M engineers claim the amount of Balsam Wool used in this year's models far exceeds standard requirements for the units. Insulation is especially thicker in the C-4 model.

Final feature is price. While no schedule is available, F-M is claiming that with all plus-values considered—low operating cost, low servicing cost, longer life, and convenience features—the 1936 models are actually lower in cost than most other refrigerators.

The Complete Line

Fairbanks-Morse's "C" line, new for 1936, is in four models, which range from 4.2- to 6.2-cu. ft. net food storage capacity. All the 15 "star" features are included in the line, with restyled cabinet and a larger and improved escutcheon most noticeable at first glance.

Model C-4 has 4.2-cu. ft. capacity, and a shelf area of 9.25 sq. ft., with Conservador. It has an 11-point temperature control, and two ice cube trays, which make 42 cubes or 5 lbs. of ice per freezing.

Model C-5 has a net capacity of 5.4 cu. ft., and a shelf area of 10.55 sq. ft. Its three ice cube trays make 63 cubes, or 7½ lbs. of ice, at a single freezing.

Next in size, C-6, has a storage capacity of 6.3 cu. ft., and a shelf

area of 12.55 sq. ft. Its ice cube capacity is the same as the C-5 unit. The C-6-Super, last of the line, has identical capacity and shelf area as its companion model, the C-6. Feature of this unit, however, is its ice cube capacity. There are four trays, with a capacity of 84 cubes, or 10 lbs. of ice, at a freezing.

In addition to the "C" line, Fairbanks-Morse is also offering a "B" line of five models, intended primarily as a price leader. These models are identical with the company's 1935 Conservador line, and have smartly-styled cabinets, chromium-finish hardware, black base (not, however, flush with the floor), and the Conservador feature.

Model B-4, smallest of the line, has a capacity of 4.14 cu. ft. and shelf area of 9.25 sq. ft. There are two ice cube trays, which make 42 cubes at a freezing.

Model B-5 has a cubical capacity of 5.11 cu. ft., a shelf area of 10.55 sq. ft., and three ice cube trays producing 63 cubes per freezing. Model B-6, with 6.01 cu. ft. storage space and 12.55 sq. ft. shelf area has the same ice cube capacity as the B-5. The B-6-Super, next in the line, has the same specifications as the B-6, except that it has four ice trays producing 84 cubes at a freezing.

Model B-8 is the largest in the line, and has a capacity of 8.01 cu. ft., and a shelf area of 15.76 sq. ft. It also has four trays, which produce 84 ice cubes per freezing.

Differences between the "B" and "C" lines are many. Briefly enumerated (Concluded on Page 4, Column 1)

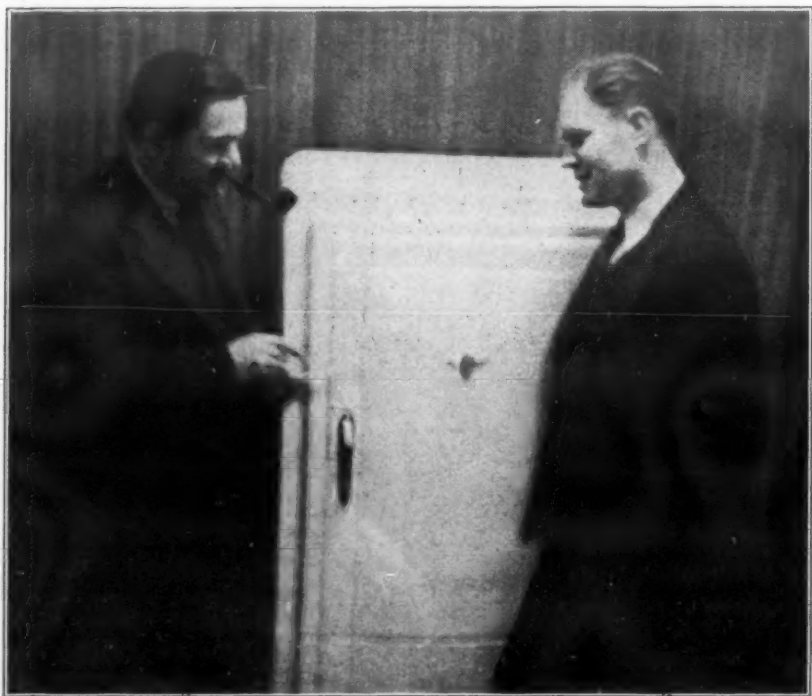
15 Stars In the presentation by Fairbanks-Morse salesmen



W. Paul Jones takes a leaf out of John H. Patterson's book—and pastes 15 stars on it. "That stunt looks like a 'honey' to me," says George Taubeneck.

'We're Ready to Bat in the Big League Now'

Says Charles D'Olive of Stewart-Warner



Editor Taubeneck is impressed by the illuminated control.

NEWS

FLASH!

\$12,500,000 worth of orders at retail value for 1936 Household Kelvinators were placed by the distributing organization for shipment in the January quarter at the conclusion of the Kelvinator convention last week in Detroit. More than double last year's orders.

This was their response to the announcement of new products and new sales and advertising plans for 1936.

We believe this to be a record, unprecedented in the history of the electric refrigeration industry.

Big Things Are Happening at Kelvinator.

SPARTON PUTS SPOTLIGHT ON CABINET CONVENIENCES

Fairbanks-Morse

(Concluded from Page 2, Column 5)
ated, they include: Thermocraft insulation in "B" models; Balsam Wool in "C" models; automatic expansion valve in "B" models, thermostatic expansion valve in "C" models.

Cabinets on both lines are somewhat similar in general design, but the "C" Series is more streamlined, has a base which is flush with the floor in front, and of heavier channel steel construction. "C" models also have the touch-open door latch, while "B" models have the conventional handle. Nameplate on "C" models has also been enlarged and made more in harmony with other appointments. Conservador button is separate on "B" models, while it is a part of the door-latch on the "C" line.

All models have Dulux exterior finish, while interiors of both lines are in acid-resisting porcelain.

Practically all of the 1936 promotion and advertising plans are centered around the "C" line, with the "B" models apparently available to dealers who are dealing with prospects who desire Conservador convenience at lower cost, or who want to meet "price" competition.

Sparton

Anti-Frost Clock

Leading feature of the Sparton line again this year, of course, is the Anti-Frost clock, which is credited with a large share of the company's sales success story last year. Deluxe models also have the Baskador, Vegabin, and a new convenience feature, the Baskadrawer, which fits into the bottom shelf of the refrigerator and provides a handy storage for miscellaneous foods.

"Cold and Silent as a Winter Night" is Sparton's electric refrigeration slogan for 1936. Appropriately, when the 150 distributors and field men attending the convention walked into the convention hall last Tuesday they saw a blue, cold, icy background—with the slogan prominently displayed.

The new models were on the floor—but covered.

Finally, after a welcoming talk by General Manager Harry G. Sparks and remarks by Arthur T. Haugh, general sales manager, the new Spartons were unveiled by Sales Manager E. T. H. Hutchinson—to be greeted with more genuine enthusiasm than distributors and field men have shown in years.

Seven models are in the 1936 line, which has been designed by Assistant Sales Manager Harley Wall, covering a size range of from 4- to 9-cu. ft. capacities. Deluxe, or "D" models, are equipped with extra convenience features, while the Standard, or "S" models, minus those features, are designed to give the lower income classes efficient refrigeration, minus gadgets, at minimum cost.

Standard and Deluxe

Standard features on all Sparton models this year include Sparlac exterior finish, brass hardware and trim, chromium plated, positive ice tray release, 10-point cold control, porcelain interior, porcelain enclosed cooling unit, and electric interior light.

In addition, deluxe models have the Anti-Frost clock, Baskador, Baskadrawer, Vegabin (for storage of fruits and vegetables not requiring refrigeration), and four-piece Kontanerette, for storage of miscellaneous items of food.

The Sparton refrigerating mechanism, located at the back of the cabinet base (to make room for the Vegabin), is set on four springs, each of different size, and minus the center pins, often a cause of needless noise in refrigerating units.

Insulation is Balsam Wool, sealed to provide added protection against heat leakage from the cabinet.

Sparton distributors and dealers are going into the accessory business in earnest this year—for their own good as well as their customers' convenience. All deluxe model features, including the Anti-Frost clock, are readily adaptable to standard models at slight additional cost.

Thus, if the customer wants only one deluxe feature, such as the Baskador or Vegabin, or clock, she may obtain it, with its cost added to the price of the standard model she chooses. This permits the customer a wide variety of selection in her refrigerator.

Leading the Sparton line is the D-466, a unit of 4.6-cu. ft. capacity, and with all the deluxe features with the exception of the Anti-Frost clock. The standard model in this size, S-466, is, of course, minus the deluxe features, and in addition has no door on its evaporator compartment. Shelf area of this model is 8.7 sq. ft., and its three ice cube trays provide 42 cubes, or 4 lbs. of ice.

Next, in size, are the D-616 and S-616 models of 6.1-cu. ft. capacity, and 12 sq. ft. shelf area. The deluxe model has all the Sparton extra features, and both have five ice cube trays, making 70 cubes, or 6.7 lbs. of ice, per freezing.

Models D-746 and S-746 are next in size, with 7.4-cu. ft. storage space and 14.5 sq. ft. shelf area. Ice cube capacities are the same as in the 6-cu. ft. models. These models, as well as all those above the 4-cu. ft. size, have the four-piece Kontanerette in the deluxe units.

Largest model in the Sparton line, the D-906, has 9 cu. ft. of storage space and a shelf area of 17.1 sq. ft. Its six trays make 84 cubes, or 9.3 lbs. of ice, at a freezing.

In presenting the line, Mr. Hutchinson emphasized that Sparton had just gone through its most successful year in refrigeration, and was looking to even greater things in the year ahead. Evidence of this, he said, was in the fact that this year, models, advertis-

ing plans, and dealer helps are ready and waiting, so that distributors can "get going" right away.

Sparton field men have already been through a three-day school in which all the features of the new lines have been explained to them, so that they are equipped to go right out in the field and help dealers do a constructive selling job.

Distributors were urged to help the factory in formulating models and plans for next year. "You're out in the field—you know what you want, what your prospects want, in a refrigerator," Mr. Hutchinson said. "Give us ideas—tell us what you want us to give you to sell."

"Know how your product is built—take a trip through the Sparton plant, and learn how we build quality into our models, from the ground up. Then you'll see this Sparton picture as we, here at the factory, see it."

All appointments on the 1936 Spartons are in high lustre black, white, and chromium, to harmonize with surroundings in the kitchen. Concealed type hardware of solid brass, chrome-plated, is used throughout.

The dry expansion system is employed in all models, and Sparton claims it to be unusually trouble-free in operation.

Deluxe models have the Baskador, which lends added shelf space for eggs and small packaged products, such as butter, cheese, and bacon. The Anti-Frost clock has had its face greatly improved, with lettering in keeping with that on the rest of the refrigerator, modern numerals, improved hands, and adjusting knobs larger and more easily operated.

The Baskador is heavier, of ribbon steel, and offers enlarged storage capacity. In all deluxe models, except the D-906, there is a compartment for the Sparton recipe book.

The Baskadrawer, a new feature this year, is a sliding wire container suspended from the lower shelf for miscellaneous foods. It has a neatly designed front which harmonizes with the interior, and is removable and portable.

The Sparton escutcheon plate is also of new design, to fit in more closely with the other refinements on the units.

Crosley Manufactures Washers & Ironers

(Concluded from Page 1, Column 3)
tories by engineers of the radio division.

Crosley's expansion into the washer and ironer business was announced by Powell Crosley, Jr., president of the company, and came as a result of several months study and survey of the field by Mr. Crosley himself.

The new washer and ironer merchandise is in production, and officials claim that orders received during the convention for the new lines exceed the estimated production.

Demands for the new refrigerator line exceeded the orders of a year ago for the first two months of the year, causing Mr. Crosley to say:

"We formerly received many of these orders in February and March. This is a sure indication that business is on the upswing, and gives us confidence to justify our anticipation that the current year will be one of big business."

President Crosley explained the operation of the new radio improvements as follows:

"Music can now be reproduced exactly as it is broadcast.

"Let me give you a picture of the entire operation, beginning at the studio. Just outside sits a monitor, a man whose duty is to 'tone down' those fortissimo passages that make an orchestra so colorful. If he did not do this those same passages would blare into the microphone.

"The result is that the music going over the air is different than that given by an orchestra. This is true of singing and all forms of music and voices.

"These twin inventions actually restore, in the receiver, what the monitor outside the studio takes out. They provide true-to-life reproduction, on the same basis as if you were within the studio yourself."

Throughout the convention informal tours were made through the Arlington St. plant of the Crosley Radio Corp., and radio stations WLW and WSAT.

Delegates were entertained with a dinner dance and show at the Hotel Gibson roof gardens.

Hunting Joins G-E Supply

PHILADELPHIA — Russell Hunting's appointment as district appliance sales manager of the General Electric Supply Corp. here became effective Jan. 1.

Mr. Hunting has been for the past four years with E. B. Latham & Co., New York City, as manager of the refrigeration department.

Selling Problems Analyzed by Sparton Executive at Distributor Meeting

(Concluded from Page 1, Column 4)

seemed to him to be much lower than in the United States. "In spite of Washington," he told distributors, "you are going to have a successful year."

He advised distributors to "get into politics more than you ever have before . . . for your own good" as well as for protection against the rising tide of taxation, which, he said, "your children and children's children will have to pay."

General Manager Harry Sparks next explained changes in operating procedure which Sparton has recently effected. Under the plan, the company has been split into several subdivisions, each independent of the others, and each faced with making a reputable showing on its own account. This arrangement, according to Mr. Sparks, has led to economies in manufacturing, merchandising, and advertising practices, which are in turn reflected in higher quality and lower cost of the finished products.

Managers of the various subdivisions, while in actuality a part of the same organization, deal with one another as though they were members of entirely separate organizations.

"We are an old-fashioned company," Mr. Sparks declared, "and we want nothing more than to continue to be old-fashioned. We don't want to make the front page—we are content to dig in quietly, making our product prove by its performance the worth of the company that is behind it."

Asks Distributors' Ideas

He asked distributors to submit ideas which the production and manufacturing divisions could consider in making up the 1937 line of radios, which will be announced some time next summer. The same request, he added, applied to refrigerators.

"You're out on the firing line," he declared. "You know what the public wants and will buy. After the models are out, it's too late for ideas. Help us to help you by giving suggestions on what we can do to make our products even better than they are now."

Sales Manager E. T. H. Hutchinson next unveiled the new Sparton refrigerators, giving brief explanatory remarks about each model in the line. "The best piece of refrigeration mechanism in the industry today," he called them, as a class.

He called particular attention to the fact that, this year, Sparton is ready—with product, advertising plans, and dealer sales helps. There is nothing to prevent distributors starting the selling season off right away, he said. Even the Sparton field organization has been pre-trained for the campaign, with a three-day school prior to the convention.

Discusses New Refrigerators

Assistant Sales Manager Harley Wall, the man who is primarily responsible for most of the refinements and improvements on the 1936 models, next "took them apart" for distributors, and told in detail just how and why everything was as it is.

Unit prices of refrigeration is going steadily down, Mr. Wall said, because the higher income classes are largely saturated, and the present and future needs lie in the lower income market, where families are large, and where adequate storage space and food protection are essential.

Sparton's refrigeration mechanism remains unchanged, with compressor and evaporator the same as in last year's models. Only minor improvements and refinement have been made.

Most novel thing in Mr. Wall's presentation was the introduction of an accessories display card, which Mr. Wall said, "will put our dealers in the accessory business." All accessories and deluxe equipment, up to and including the Anti-Frost clock, can be put on the standard line, in the field.

"You can get more than 90 different combinations from the seven models in our line," Mr. Wall told distributors. "Now you can make it possible for dealers to sell refrigerators tailor-made to the customer's desires and requirements."

Specialty Selling

Sparton this year is moving definitely into the specialty selling field. Several new distributors were at the meeting, their first Sparton convention. Fewer models are being sold through large outlets.

Exclusive dealerships is another Sparton aim for 1936. "Business in refrigeration is obtained by going out and getting it; not by waiting for it to come back in to you," Mr. Wall reminded distributors. "See that you obtain exclusive dealerships for Sparton; then you can be sure that your product is being given its proper share of attention."

Tuesday night was the annual dinner and entertainment in the ballroom of Hotel Hayes. Entertainment was

by Gerald Strong's orchestra of Jackson, and acts were presented by the Lewis Sisters, song and dance team, Montiforti Sisters, an instrumental quartet, Adam Morgan, violinist, and the Brown Buddies, five fast-stepping colored youths.

Wednesday's sessions were devoted to a discussion of advertising and sales promotional plans, and service policies.

General Sales Manager Haugh opened the meeting by stressing the possibilities of service work to distributors. As a concrete example, he pointed to the Seattle Radio Co., Sparton distributor in the northwest, which maintains a radio service plant financially independent of the distributorship, and which, last year, did a business totaling \$250,000, and covering five states.

He urged distributors to get into refrigeration service work also.

"Independent service men are springing up from coast to coast, and are taking this worthwhile business away from you," he warned. "If you don't maintain an efficient service organization, you're missing the boat on a very good opportunity."

Sales Promotion Plans

Advertising Manager Guy Core presented Sparton's sales promotional materials. For salesmen, there is a leather zipper sales kit, containing 21 pictures of models and features, arranged so that distributors' field men can present their stories to prospective dealers as effectively as possible.

Promotional materials include a window and store hanger, in four colors; direct-mailing pieces of various sizes and sorts; flasher signs for dealer's windows; two 16-piece bridge sets, which dealers can give away to users who turn in names of prospects who buy Spartons; prepared radio spot announcements, and radio continuity materials.

Advertising material will be sold to distributors in bulk, at a set price, so that the distributor will have it available to give to dealers immediately after they have signed their franchises. After the dealer work is over, the factory will rebate to the distributor part of his promotional material cost, on the basis of the number of dealers signed by him.

Sparton's 1936 national advertising campaign will be carried on in newspapers only. No magazine or radio campaign is planned on the refrigeration line. By limiting advertising expenditures to newspapers, Sparton officials feel that they will be able to use their funds more effectively than in the past, and be sure that every advertising dollar is getting 100 cents worth of attention.

Key cities will be used, and key newspapers in those cities. Larger dealers, naturally, will receive most benefit from the national advertising campaign, but Sparton feels this is justified, in view of the fact that large cities are responsible for most of the sales.

Dealer campaigns will be tuned to fit in with the national campaign, and distributors will go 50-50 with dealers in smaller communities in their campaigns in local daily and weekly newspapers.

Frigidaire Field Men Attend Convention

(Concluded from Page 1, Column 4)

sions on East First St., the Inland division factory on Inland Ave., and Delco Products No. 2 on Wisconsin Blvd., and inspecting the two Frigidaire plants at Taylor St. and Moraine City. The men will be luncheon guests of E. R. Godfrey, Frigidaire works manager, during their visit to the Moraine City plant.

Thursday will find the visitors at the Engineers' Club attending a business session on household refrigerator sales presided over by Frank R. Pierce, manager of the household division. Carl A. Copp, Frigidaire's general sales manager, will represent the management in greeting the men. E. B. Newill, chief engineer, L. A. Clark, household advertising and sales promotion manager, V. E. Hetzel, installation and service manager, H. J. Walker, Jr., public utilities division manager, and others will speak. At night, the men will attend a boxing match at Memorial hall.

Friday, the final session of the convention will be devoted to a discussion of commercial products presided over by Roy E. Smithson, manager, commercial division. Members of the staff of the commercial division will lead the various symposiums.

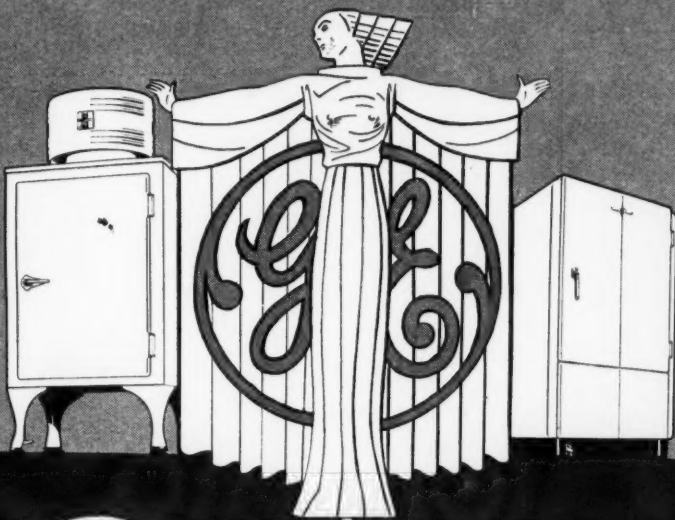
Following the close of the convention, the men will return to their various districts coast-to-coast to make ready for the annual spring territorial conventions at which their own organizations will be given the information covering 1936 plans.

'We're All Set, Let's Go'
Says E. T. H. Hutchinson to Sparton Distributors



"I'll be looking for the results in the columns of the News," says George Taubeneck as Sales Manager Hutchinson wishes good luck on the voyage.

FOR



1936

"I want the
lowest-cost,
dependable
refrigerator
I can buy."

"I want beauty, style,
and of course
all the modern
convenience
features."

You've got just what they want!

... IN THE NEW GENERAL ELECTRIC REFRIGERATORS

THE NEW 1936 LINE of General Electric Refrigerators is ready.

Here in *one* line you have everything that attracts refrigerator buyers. New beauty, new convenience features, and the famous sealed-in-steel mechanism that has an unparalleled record for dependable performance at low cost.

It is a *complete* line—including Monitor



Top, Flatop, Liftop models, with prices to meet the demand of every market.

Get an early start with this line that will be the leader in the biggest year electric refrigerators have yet known! A G-E Appliance Dealer Franchise offers you quick, easy sales, great volume and net profit. General Electric Co., Appliance and Mdse. Dept., Section DF1, Nela Park, Cleveland, O.

Around the World

With George F. Taubeneck



George F. Taubeneck (on the running board) and Robert P. Nixon, assistant business manager of the News (on the left), making a final stop at the News building before heading for Jackson, Mich., and Chicago. Bob Nixon will accompany the editor as far as Texas.

How to Send Letters to the Editor Enroute Around the World

Letters and cablegrams to George F. Taubeneck, Editor of **ELECTRIC REFRIGERATION NEWS**, may be addressed to him during the next few weeks at the following points on his itinerary:

AT SAN FRANCISCO, CALIF.
Sailing date: Jan. 25, 1935.
Address: George F. Taubeneck
In care of Matson Navigation Co.,
215 Market St., San Francisco, Calif.
Or—
In care of S.S. *Maui*,
Cabin No. 390, Pier 30-32,
Matson Navigation Co.,
San Francisco, Calif.

AT HONOLULU
Mail to arrive Jan. 30 to Feb. 4.
Sailing date: Feb. 5, S.S. *Aorangi*.
In care of C. E. Nolan,
Hawaiian Electric Co., Ltd.,
900 Richards St.,
Honolulu, Hawaii.
(Cable address: "Hawalect.")
Or—
In care of R. A. Anderson,
The von Hamm Young Co., Ltd.,
P.O. Box 2630,
Honolulu, Hawaii.
(Cable address: "Vonhamyung.")

AT FIJI ISLANDS
Mail to arrive before Feb. 14.
In care of Morris Hedstrom, Ltd.,
Suva, Fiji Islands.

AT AUCKLAND, NEW ZEALAND
Mail to arrive before Feb. 17.
In care of
Guy D. Elsa, Refrigeration Dept.,
John Burns & Co., Ltd.,
Customs St., East,
Auckland, New Zealand.

AT SYDNEY, AUSTRALIA
Mail to arrive Feb. 22 to March 6.
Sailing date: March 7, S.S. *Marella*.
In care of F. E. Hansen,
F. C. Lovelock, Ltd.,
235 Clarence St.,
Sydney, Australia.
(Cable address: "Lovelock-Sydney.")

AT SOERABAYA, JAVA
Mail to arrive before March 24.
In care of T. P. Timmerman,
General Netherland-Indies Electric Co.,
Soerabaya, Java.

AT SINGAPORE,
Mail to arrive before April 1.
In care of H. C. Faxon,
The Borneo Co., Ltd.,
Finlayson Green,
Singapore, Straits Settlements.

AT CALCUTTA
Mail to arrive before April 14.
Refrigeration (India), Ltd.,
62 Hazra Rd.,
Calcutta, India.

For Sale: Fastest Car on Road

Outside of our Pacific Coast friends—whom we'll be visiting in their own balliwicks for the first time in a few days—there are few active men in refrigeration who haven't seen and examined the editor's Auburn 12 speedster.

For the last two and a half years it has regularly been making the rounds of conventions, dealer meetings, code hearings, engineering laboratories, manufacturing headquarters, and offices of leading merchandising organizations.

Names of the men who have taken a ride in it would comprise a good Who's Who in Refrigeration.

At the present time we are driving it to the Pacific Coast (and boy, is it swell driving on a long trip!) intending to sell it out there, so that we can have that money to spend on this tour of the world.

Thinking that it would make an excellent car for a refrigeration organization—especially from the standpoint of showmanship—we'd like to outline some of its good features:

It still holds the world's record for stripped stock cars—118 miles per hour. Will do 90 in second. (If you want to make a little change on the side, bet a Ford V-8 owner that you can go faster in second than he can in high. Will do it every time.)

Its 12-cylinder, 160-hp. motor delivers tremendous power and acceleration—you can beat any of 'em at a stoplight, and anything that's on the road (except possibly a Duesenberg, which we've never met).

This engine is now being sold by Lycoming for use in fire trucks and cabin cruisers. Would make an excellent car for towing traveling exhibits of appliances.

Its bullet-shaped body (finished in ivory and black) still draws small crowds when it pulls up to the curb, notwithstanding the fact that streamlining is common today.

It gets 10 to 12 miles per gallon, and uses no extra oil (all you do is change oil every 1,500 miles).

To appreciate its smoothness and ease of handling you must drive it. And we'll guarantee you'll be thrillingly surprised.

Its weight (4,400 lbs.), long wheelbase (134 in.), extra wide tread, unusual lowness, and heavy steel construction combine to make it an exceptionally safe car. I have had a tire blow out traveling 90 miles an hour without deviating from my line on the highway.

It is equipped with a specially-built Majestic radio (given by JOHN DITZELL), an extra pair of long-carrying Spanton horns (four horns in all), compass, clock, cigarette lighter, six wire wheels, and all the trimmings.

Oh, yes. A few months ago Borg-Warner friends installed an entirely new transmission, clutch, and universal joint.

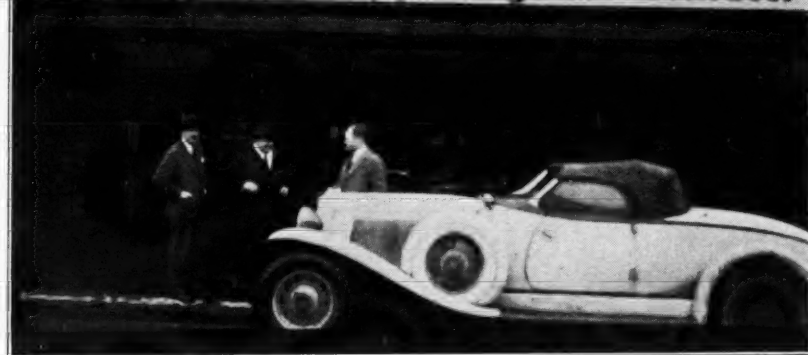
Want it? Ask for a demonstration. Expect to arrive in San Diego this week and will be in Los Angeles by the time this issue reaches readers in that city.

Car for sale! The highest bidder takes it!

Telephone George T. Bauder, 1127 Fourth Ave., San Diego or George Belsey, 1001 Hope St., Los Angeles, and place your bid for George Taubeneck's car, and by George you'll get a bargain.

ELVINATOR DISTRIBUTOR CONVENTION

Big Things are Happening at Kelvinator



George W. Mason (center), president of Kelvinator, and H. G. Perkins (left), vice president, arrive for the Wednesday afternoon session of the distributors meeting just as George Taubeneck was leaving the theater to start westward on a world tour. Before the day was over he had

visited the Sparks-Withington plant at Jackson, Mich. On Thursday (Jan. 9) he saw the Stewart-Warner and Fairbanks-Morse new lines of refrigerators in Chicago. Friday he visited manufacturers in St. Louis (see story next week), Monday (Jan. 13) he wired from Dallas, Texas.

Best Wishes to George

Wilmington, Del.

Editor:
Best wishes for a most instructive, enjoyable, and profitable trip. Don't do anything I wouldn't do.
TOM COYLE.

A Nice Room in Texas

Evers Hardware Co.
Denton, Texas

Jan. 5, 1936.

Editor:
I understand that you will sail through this town in about one week from today.

If possible I would like very much to see you a few minutes. I am personally acquainted with your old chum Jno. T. Schaefer, also an old subscriber too, and have been an advertiser in the News.

This town is 175 miles south of Oklahoma City on highway 77. My telephone number will be either 200 or 263.

Also will have handy a nice room for a weary traveler. Don't let me down now.
A. F. EVERS, JR.

Stop at San Diego

George T. Bauder Co.
Distributor
General Electric Refrigerator
1127 Fourth Avenue
San Diego, Calif.

Mr. Taubeneck:
I was pleased to receive your note of December 30 to the effect that you may be expected to drop in upon us some time after the eighteenth. You will indeed be most welcome.
GEORGE T. BAUDER.

'Sounds Most Enticing'

The George Belsey Co., Ltd.
1001 South Hope St., Los Angeles

Editor:
I am glad to have both your letter and telegram, announcing what I believe must be your first visit to Los Angeles since **ELECTRIC REFRIGERATION NEWS** was started.

As I wired you, I am sorry that I will be away on my vacation. It is the first one in three years which I could properly call a rest vacation, and its sole purpose is to really get a rest. However, Bob Mangan, our advertising manager, and Archie Marsden, our retail sales manager, as well as all of the others in our organization, will be glad to welcome you and to be of any assistance possible while you are here. I hope you will make my office your headquarters, and Miss Hoff, my secretary, will be glad to assist you in any way she can.

The trip around the world sounds most enticing. That trip is a more continuous temptation to those who live in a seaboard town. Every time we can grab a few minutes, we dream about its possibilities. I hope, and am sure you will have a very pleasant trip.
GEORGE BELSEY.

A Week in Honolulu

The von Hamm-Young Co., Ltd.
P. O. Box 2630, Honolulu, Hawaii

Editor:
We were interested to learn that you plan a trip around the world, making a stop here in Honolulu.

Honolulu is a small place, and you will be able to contact very easily all of us who are in the refrigeration business with our headquarters in this city. This company has branches on three of the outside islands, but you could get a good picture of the industry in this territory by visiting Honolulu only.

If you could stop over for a week or at least for three or four days between steamers, I am sure you would find much of interest.

R. A. ANDERSON, Mgr.,
Refrigeration & Elec. Products Dept.

Introductions to Norge

Distributors Abroad

Norge Division, Borg-Warner Corp.
670 E. Woodbridge St.
Detroit, Mich.

Mr. Taubeneck:
I am enclosing twelve letters of introduction to our distributors abroad located in some of the countries which you intend to visit on your coming trip.

Allow me to suggest that whenever you get to territory where we are already represented that you write to our distributor in advance informing him of your approximate date of arrival, and stating that you have a letter of introduction from us which you will deliver personally upon reaching the destination. In this way they will be able to make arrangements to take care of you during your stay in that country.

Wishing you a very pleasant voyage.
C. L. FOSSATI,
Asst. Export Manager.

'Perfectly Wonderful'

Kelvinator Sales Corp.
Cambridge, Mass.

Editor:
Very best wishes for a perfectly wonderful trip around the world. Upon your return sincerely hope Boston will find a place in your itinerary for one of your immediate visits so can see the movies I hope you will take. Good luck and be sure to come back because Kelvinator and the industry in general needs George Taubeneck.
MILDRED SCOTT.

Down Under Equator

832 Rankin Ave., Erie, Pa.

Editor:
Have been a subscriber to the News since returning from Australia in 1932 and have enjoyed reading your stuff so that I am prompted by your world itinerary to suggest some names who are prominent in refrigeration in New Zealand and Australia. These are as follows:

Nelson Jones and W. Ackland of National Electric Supply Corp., Auckland, N. Z.; Mr. S. V. (Sammy) Cox, Mr. Harold (Pete) Van Valzah, Associated G. E. Industries, 93 Clarence St., Sydney; Mr. T. M. (Tom) Ritchie of Noyes Brothers, Clarence St., Sydney; Mr. Gordon Himwood, Associated G. E. Co., Brisbane, Queensland. You will enjoy meeting these. I know, for all have been around a bit in many things besides refrigeration.

I know you have a huge pile of letters and you are going to have some of the experiences described by all and sundry, but also you will have some that will be with you as long as you live.

I am particularly interested in your reactions to those two British Dominions down under and shall look forward to your comments.

JOHN B. BRADY.

An Interview in London

J. Lyons & Co., Ltd.

Cadby Hall, London, W. 14, England

Editor:
We shall be pleased to have an opportunity of interviewing you on your visit to this country.

No doubt we shall be able to discuss matters which will be of interest to both parties.
S. JOLIFFE BUTLER,
Chief Engineer.

Welcome to Vienna

Warchalowski, Reckzuegel & Co.
Vienna, Austria

Editor:
We shall be very pleased to welcome you here in Vienna on your intended visit.

We are ready to give you any information required about the market, etc.

WARCHALOWSKI, RECKZUEGEL & CO.

"AN OLD NAME IN A YOUNG INDUSTRY"

CURTIS

A Complete Line—59 Units

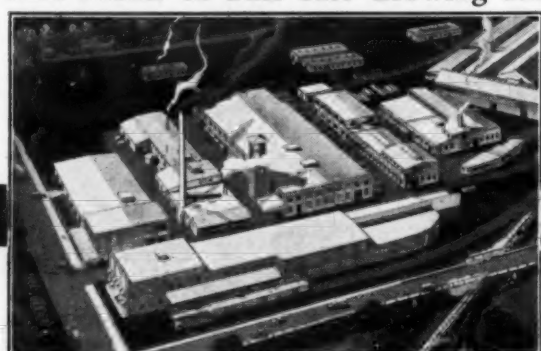
Fair Policy—81 Years' Successful Merchandising

Quality Workmanship—41 Years' Building Compressors

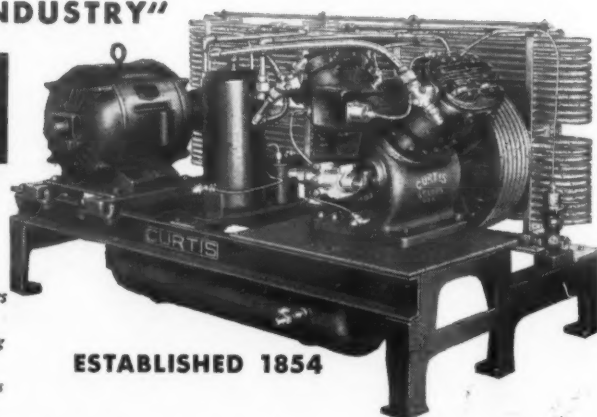
Financial Stability—Aaa1 Highest Capital & Credit Rating

Proven Design—13 Years' Building Refrigeration Units

Only by Building Permanently on This Complete Combination Can You Secure Sure Profits in This Fast Growing Industry—



Air View of Curtis 20 Acre Plant



ESTABLISHED 1854

Curtis is a well integrated institution, having its own gray iron foundry, brass foundry, machine shop, pattern shop, tool room, electric welding department, structural shop and power plant.

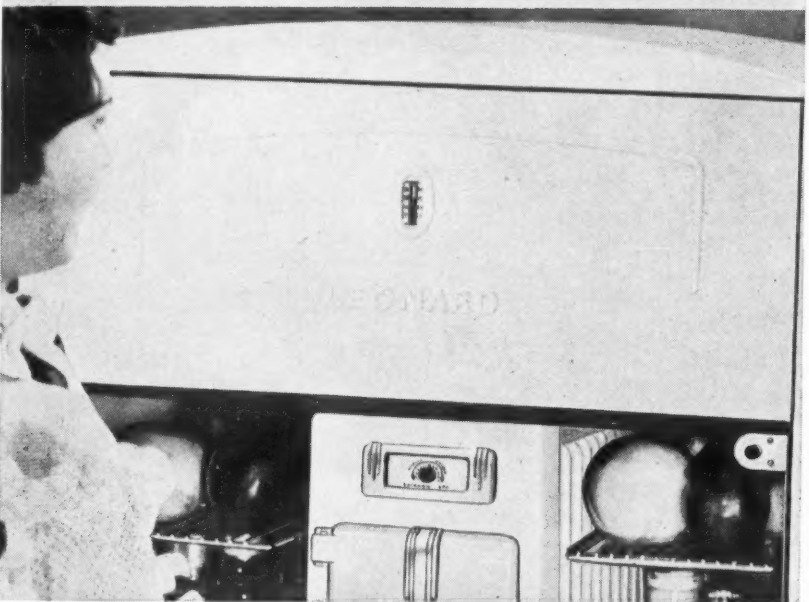
CURTIS REFRIGERATING MACHINE CO.

Division of Curtis Manufacturing Co.
1912 KIENLEN AVENUE • ST. LOUIS, MISSOURI

In Canada:

CANADIAN CURTIS REFRIGERATION CO., LTD.
20 George St., Hamilton, Ont., Can.

THEY CLAIM THAT THE 1936 LEONARD 'HAS EVERYTHING'



The housewife in the top picture demonstrates the manner in which the vegetable storage drawer in Leonard's 1936 refrigerator is used. Note the new design of the Leonard foot pedal. Below is shown the temperature indicator by which the user can determine the temperatures being maintained in the food storage compartment.

carrying complete specifications and features of the various models.

But the novel feature of this manual is that the various models are classified by family requirements (a family of four takes a model of certain capacity, a family of five a size larger, etc.) to guide the salesman in selling refrigerators of proper size.

This retail sales manual also tells the health and convenience story on electric refrigeration "in a way that it has never been told before," claims Mr. Sowell.

Mr. Sowell announced a contest for distributor's wholesale men which will close March 1, in which prizes will be granted to those wholesale men who get the most dealers into the pre-showing, and who get them signed up with a Leonard franchise.

Sales promotion literature on this year's Leonard line will be comprised of such fundamentals as a line folder, envelope inserts on features, and other similar tried promotion pieces. New specified activity is an "owner's remuneration" plan for users who turn in the name of prospects who later buy a Leonard refrigerator.

The Leonard sales promotion department will shoot the works on the "Leonard festival," the opening showing of the new line to the public which will be held starting the end of February.

Giant handbills in color, special newspaper copy, specially designed window display and showroom background equipment, and outside banners heralding the showing will be supplied to dealers.

Displays this year will be illuminated. All dealers subscribing to the display service will also get a Neon window sign.

Another new activity this year is

the formation of the "Leonard Crest" club, an honorary organization for retail salesmen who make a minimum requirement on sales, established as the entrance requirement for the club.

Sales Manager Petrie closed the convention by telling the distributors the factory's suggested methods of showing the new line to the dealer, and described the main points in Leonard's sales planning for this year.

A pre-showing schedule has been worked out, said Mr. Petrie, whereby dealers may be brought into the distributor's headquarters in small groups to view the new line.

When the dealer comes in the distributor will give him a "canned" presentation, which among other things, outlines a definite plan by which the dealer can operate, including the sales training plan mentioned previously. Present schedule calls for the pre-showings to be completed by the latter part of February.

Mr. Petrie described for the distributors the graphic way in which the factory will at all times keep the distributor cognizant of his current status—on the basis of his sales to dealers.

A map of each distributor's territory, with county lines drawn, will be sent to the distributor each month. This map will give him a check on his sales to dealers by counties by month, and will be so inscribed as to let him know how he stands in comparison with his efforts for a similar period in the previous year, and how he stands with relation to his current quota.

On each map the counties will be colored in either "red," "gold," or "green." A red county is one in which the distributor is under quota, a gold county is one in which he is over

quota, and a green county is one in which there are no towns of more than 1,000 population.

At the top of each map will be a set of four figures. The first figure will show his cumulative sales last year to the end of the period specified; the second figure will show his sales this year to the end of the period specified; the third figure will show his quota to the end of the period specified; and the fourth figure gives his quota to the end of the next period.

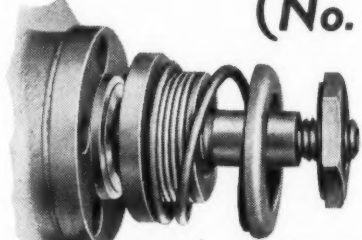
In Leonard's 1936 "L" series of models, which have the Permalain exterior finish, there are five models with these respective food storage capacities: 3.16 cu. ft., 4.15 cu. ft., 5.15 cu. ft., 6.18 cu. ft., and 7.25 cu. ft.

Convenience features standard with this line (except for the smallest model) include the Chillometer, rubber grids in each tray, built-in temperature indicator, electric light, enclosed porcelain evaporator with self-closing aluminum door, rearranging shelf, sliding shelf, vegetable crisper with serving tray top, utility basket, extra ice freezing capacity, and extra bottle space. Models larger than L4-36 also have the Leonard foot-pedal door opener, refrigerated shelf, and ice tray release.

In the "P" or all-porcelain series are four models with respective net storage capacities of 5.15 cu. ft., 6.18 cu. ft., 7.25 cu. ft., and 10.59 cu. ft. Features are the same as those in the larger models in the "L" series.

The two leader models designated as the "LS" series have net food storage capacities of 5.25 and 6.17 cu. ft., respectively, and have the Chillometer, porcelain evaporator, electric light, rubber grids in each tray, and vegetable crisper with white porcelain top.

20 QUALITY FEATURES (No. 4)



Servel's Balanced Pressure Seal has proved its dependability through more than 10 years of Service in Commercial Refrigeration

FOR 1936 . . .

Servel is pleased to pledge a continuation of the quality features that have been so well received in the past, and to further pursue its policy of constant refinement . . . The line for 1936, in both commercial and air conditioning products, will be the finest and most complete in Servel history . . . New sales agreements will be effected in certain desirable trading areas this month.

SERVEL

COMMERCIAL REFRIGERATION

SERVEL, INC. Commercial Refrigeration Division EVANSVILLE, IND.

This modern 33-acre plant is the home of Servel Commercial Refrigeration and the world-famous Electrolux, the Servel Gas Refrigerator



There is no Substitute for Experience

Leonard

(Concluded from Page 1, Column 1)
mounted on the top-front, outside panel over the machine compartment, which indicator will enable the user to tell at a glance the temperature inside the food compartment.

Chief among the host of new convenience features which have been incorporated in the new models is an unrefrigerated vegetable drawer in the bottom of the cabinet for the storage of dry vegetables.

Another new feature is a rearranging shelf, mounted on the inside of the door at the top.

The Leonard foot-pedal door opener has been retained although the pedal design has been altered to harmonize with new styling of the cabinet base.

Other features include a new freezing compartment door with the same type of design that is on the cabinet door, rubber grids in every ice cube tray, combination tray-release-and-bottle-opener, refrigerated shelf for fast freezing, sliding shelf, a crisper with a tray top, utility basket, electric light, and stronger shelves, more closely spaced.

Mr. Petrie told the distributors that the new cabinet design, with its wide frontal area, will give the housewife more usable square feet of shelf area, because she won't have to reach so far back into the cabinet.

Leonard's line this year is comprised of a standard porcelain series, a Permalain series, and two "specials" in 5- and 6-cu. ft. sizes.

Henry W. Burritt, vice president in charge of sales, officially opened the convention.

Following Mr. Burritt's opening address, President George W. Mason spoke on the possibilities which the new year holds for the refrigeration industry, and Leonard distributors in particular. Mr. Petrie then presented the 1936 Leonard line, and outlined the new features, one-by-one. Distributors were entertained at a luncheon at the Pantlind hotel, where the new models were on display.

At the opening of the afternoon's

session, Sam Mitchell, director of advertising and sales promotion, introduced B. B. Geyer and H. W. Newell of Geyer, Cornell & Newell, new Leonard advertising agency, who outlined Leonard advertising plans.

Leonard's 1936 national magazine advertising program incorporates two notable departures from previous practice.

The *Saturday Evening Post* will be used exclusively.

And every Leonard advertisement in the *Saturday Evening Post* will be in the form of a double-page spread.

The national magazine advertising will be supplemented by a local newspaper advertising campaign.

Appropriation for cooperative newspaper, billboard, and radio advertising with distributors and dealers has been increased by \$100,000 this year.

ELECTRIC REFRIGERATION NEWS (with the four color pages in this issue) carries the story of the new line exclusively to dealers this month. A trade periodical campaign using a number of leading trade papers in the electrical appliance and home-ware field will open next month.

Leonard this year means to have its product sold by trained manpower, it became evident in the outline of sales promotion and sales training plans given to the distributors by Paul Sowell, advertising and sales promotion manager.

Dealers will be supplied with salesmen, hired and trained by the distributor.

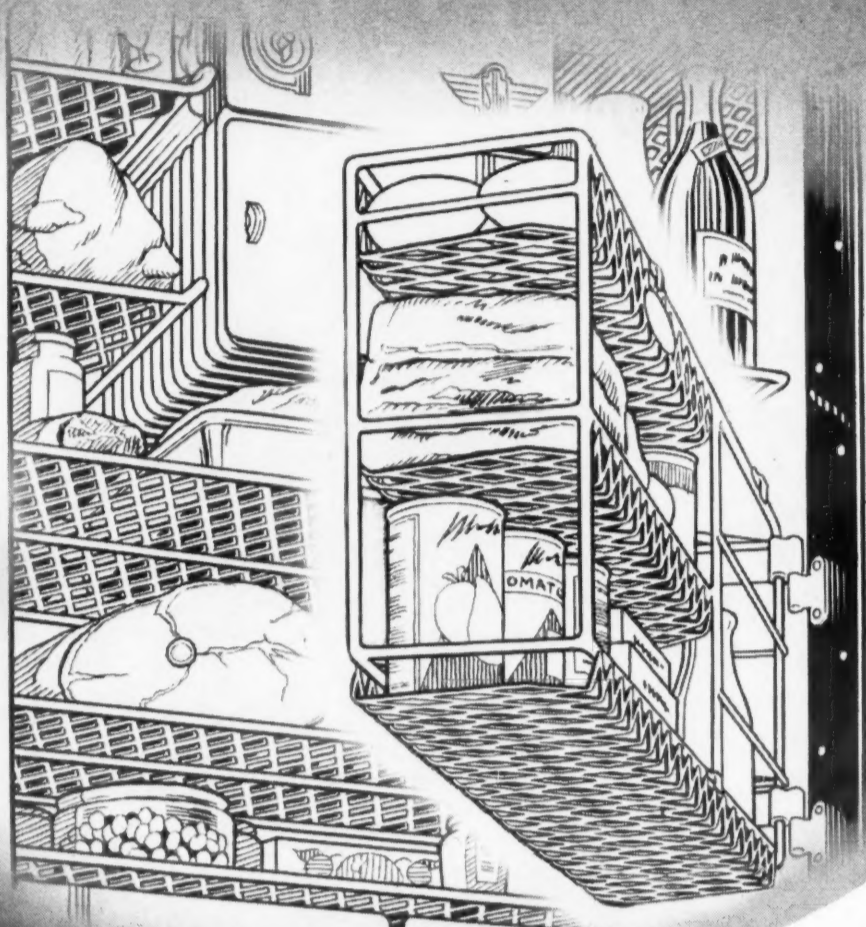
Training course for this program has been prepared by the factory, and includes four sound films, sets of meeting charts, sales texts, etc.

Just set up at the Leonard factory is a personnel division under the direction of Sales Manager Petrie and J. J. O'Neill. This division will keep six men in the field at all times to contact distributors, helping them to set up the educational program mentioned previously.

In conjunction with this educational program, mention should be made of the retail sales manual which salesmen for the Leonard line will use. It is in reality a presentation manual,

Here It Is!

STEWART-WARNER



SAV-A-STEP

and Other HIT FEATURES

How SAV-A-STEP

SAV-A-STEP is hinged
—swings easily to turn back
shelf space into front space

New!

Lifts to table with everything
for a meal! One trip! One opening of door!

New!

Famous SLO-CYCLE
twin-cylinder unit ... amazingly
economical and service-free

Exclusive!

Improved!

Jumbo vegetable crisper and fruit
basket slide smoothly on steel guides

New!

Smooth, seamless vaulted
construction gives new
strength, sanitation, beauty

**No Salesman
EVER Had So MUCH
to Demonstrate Before!**

The Biggest Sales Feature in Refrigeration for 1936!

Increase "Get-At-Able" Space 30%—Cut Current Costs—Save Work!

New! Snaps into hangers on door if users prefer—with no insulation sacrificed!

New! SLID-A-TRAY... concealed in unit compartment... rolls in and out at a touch

New! Summer-Winter range freezing control has first lighted airplane-type dial

Improved! Porcelain Freezer with reversible door makes abundant ice or desserts fast!

New! SLID-A-TRAY holds half a dozen dishes at once... frees hands for rearranging

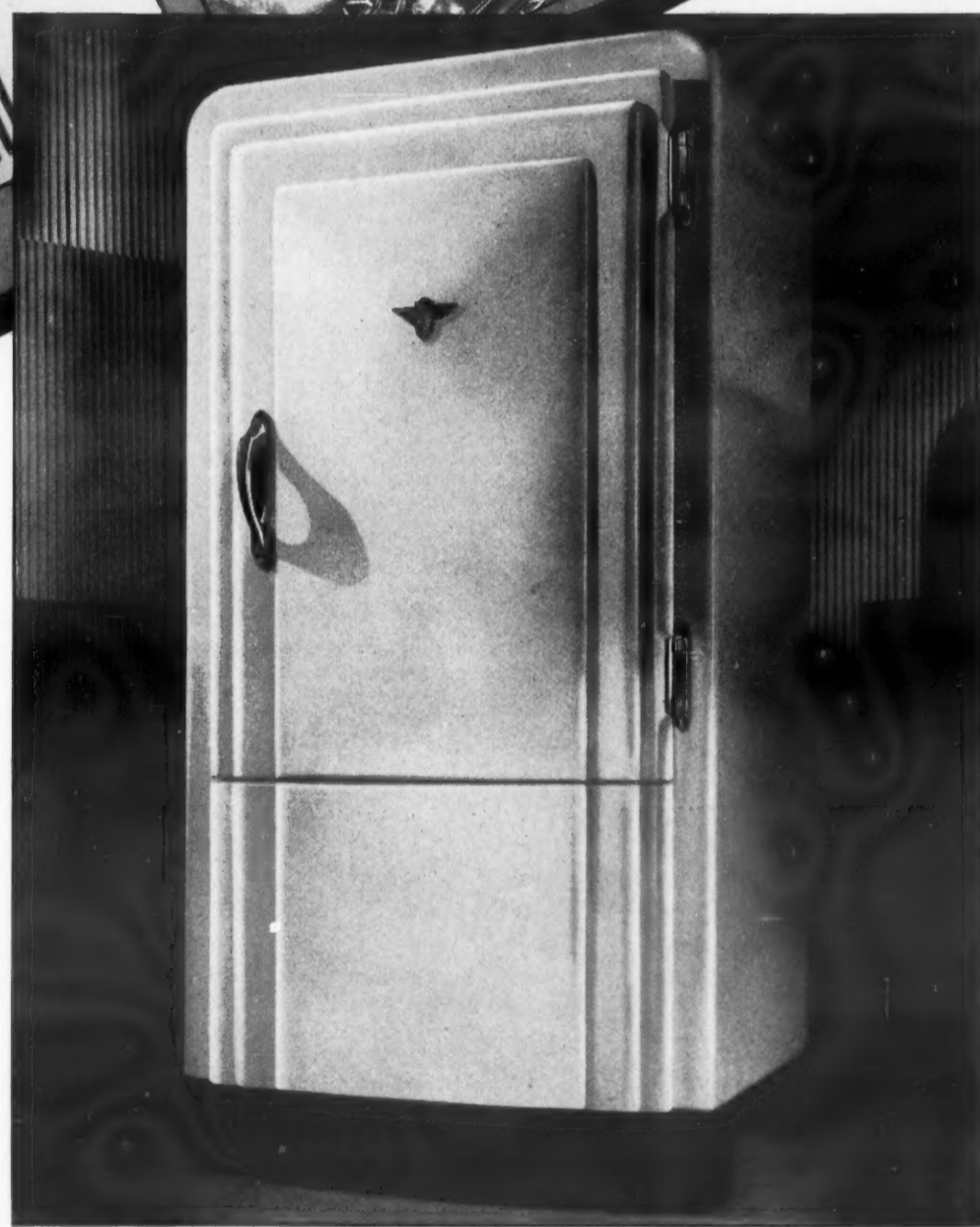
**A COMPLETE LINE
...10 Beautiful Models**

● Here's a refrigerator with more to offer you for 1936 than any other refrigerator we know about! *More eye-appeal* to bring 'em in. *More real, practical features* that women can see and handle and appreciate. And *more profit you can keep* at the season's end, because of Stewart-Warner's really amazing freedom from service losses.

From top to bottom, it's the handiest refrigerator ever offered to housewives. It has over 30% more get-at-able *front shelf* space than other refrigerators of the same cubic capacity—more flexibility to let women arrange foods as they please—more improvements to save steps and hours and dollars.

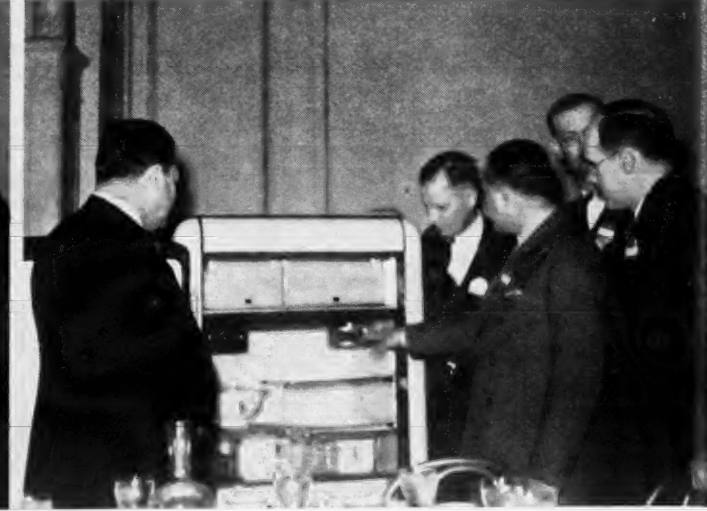
Everything you need for your most successful season is wrapped up in this one package! A refrigerator that's really news—because it's really new in every detail except the time-tried twin-cylinder Slo-Cycle unit, with its record economy and service freedom. A name known to 30 million satisfied customers. And a merchandising plan that's *right* from price structure to advertising cooperation.

Your Stewart-Warner distributor has the new Stewart-Warners now—with all details on discounts, selling aids, and other essential facts. There's good news in every line of the story. So get the details now—without obligation—and go places this year with Stewart-Warner.



*Before You Sign for '36
Learn All About*
**STEWART
WARNER**

Distributors Place Orders for 58,080 Kelvinators at Detroit Convention



(1) In a jovial mood was this quintet from the East as they arrived in Detroit to get the lowdown on Kelvinator's 1936 products and sales plan. Left to right they are Paul Krich, Raymond Rosen, Max Krich, Jack Crossen, and E. A. Wildermuth. (2) D. H. Straus (right), president of the Straus-Bodenheimer Co., Houston distributor for Kelvinator, presents District Manager Marvin Bandoli with a sheaf of orders. (3) A group of distributors examines a new Super Deluxe model. The man in the group at the right points to fan which provides forced draft circulation.

Kelvinator Conventionites Relate Sales Methods And Problems in Their Territories

By Phil B. Redeker

Poor Practices Trimming Profits, Says Carpenter

"Distributors of refrigerators are likely to find themselves in the same confused, profitless state that the plumbing and radio wholesalers fell into, unless they can get together, and with the cooperation of manufacturers and dealers, work out a program which cuts out the practices which are tending to break down their business."

So says E. G. Carpenter, who heads The Creva Co., Inc., Kelvinator distributor with headquarters in York, Pa., a man with some very definite ideas about the problems in the wholesale end of the refrigeration business.

Mr. Carpenter hasn't been in the refrigeration business for a terribly long time, but he has a vast knowledge of the wholesale business gleaned from two decades of experience as a wholesaler of plumbing supplies, and a number of other types of equipment.

As the former chairman of the Code Authority for the Wholesale Plumbing Industry under the old NRA he is well qualified to speak for the possibilities and difficulties in co-operative activities.

Volume Up, Profit Down

While the volume of business done by his company during the past year increased, the gross profit decreased, stated Mr. Carpenter, and he believes that other distributors found themselves in a similar situation. This is the best indication, he opines, that all is not as it should be for the wholesaling end of the refrigeration industry.

What, specifically, are some of the evils which are being encountered?

As might be expected, one of the major evils is price-cutting, the failure to maintain established retail prices. Attendant to this, and getting more important every day as the replacement market grows, is the outlandish allowances which dealers will make on trade-ins in order to get an order.

'Dealers' or 'Distributors'

Granting of distributor discounts to any type of outlet, with little or no regard to whether or not such outlet qualifies as a distributor, is another type of unbusinesslike practice which has a double effect—it disrupts distributor-dealer relations, and encourages price cutting.

Next evil which concerns Mr. Carpenter is the granting of "spiffs" to retailers who carry a number of lines, so that they will push one particular make.

In connection with this problem, Mr. Carpenter had an interesting story to tell:

A \$1,000 Bet

"We had put our line in a music house in one of the larger cities in our territory, but we weren't getting the volume we expected. So I dropped into the town one day and took the dealer out to lunch.

"We discussed matters for a while and finally I said to him in a half-joking way: 'I'll bet you that you can't sell as many Kelvinators as the quota we've set for you.'

"Well, mister," replied the dealer, 'if you're going to bet me don't be a piker because so-and-so who heads

the — company just bet me a \$1,000 that I can't sell 200 of his units.'"

And, says Mr. Carpenter, that \$1,000 bet figures out to be a "spiff" of \$5 per refrigerator any way you look at it.

How to Correct Evils?

What, then, are the measures to be taken to correct evils?

Some sort of cooperative activity, believes Mr. Carpenter, with manufacturers, distributors, and dealers all taking part.

First step to be taken though, he points out, is to make all these factors (manufacturer, distributor, and dealer) realize that the problem is a mutual one—that these unbusinesslike practices will eventually prove injurious to those engaged in every phase of refrigeration production and distribution.

Trouble with cooperative movements, declares Kelvinator's York distributor, is that if one or two concerns refuse to participate it is hard to make the program effective.

With respect to trade-in allowances, Mr. Carpenter thinks some sort of a "blue book," providing a guide to set values, might eventually help in straightening out the situation. For the present, however, he views the problem as one which each distributor must figure out for himself, particularly if he is going to make any profit out of the replacement market.

Method on Trade-Ins

The way in which trade-ins are handled in Mr. Carpenter's own organization is described by him as follows:

"We allow a certain per cent of the retail price of the model which the prospect intends to buy as the maximum trade-in allowance.

"Of this percentage the salesman is charged for 40 per cent, the sales manager with 5 or 10 per cent, and we (the distributor) stand for the rest, and write our share off.

"The turned-in model is then given to the salesman, to sell it for what he can get and thereby cut down the amount he has to stand on the trade-in."

Mr. Carpenter doesn't think a whole lot of multiple-type dealer operations, especially where his line is thrown in with other not-so-well-known lines on which price cutting is likely to be the rule.

"Such dealers merely use a well-known line as a 'come-on' for its name, and then sell the prospect some other make on which it is easier to shave prices," he says.

"About the only thing the distributor can do in a situation like that, to prevent from being the 'football' which the dealer kicks around, is to jerk the franchise and set up his own retail operation nearby."

Saturation Figure Low

Mr. Carpenter had an argument to make with the estimate on market saturation which was published in the Jan. 1 issue of *ELECTRIC REFRIGERATION NEWS*. Not that he thinks that we're far off on our estimate of the saturation of the total number of wired homes, but that such a figure doesn't tell the story of the true saturation.

"Of the total number that haven't bought," he declares, "you have to figure that at least 25 per cent will never buy, at least not within the next 10 years.

"Then, too, saturation varies greatly by locality. In the communities in which we operate the people are mostly home-loving, substantial citi-

zens, who are more likely to spend their money for things to put in their homes rather than on entertainment or on clothes.

"Naturally, a high percentage of such people have purchased refrigerators.

Survey Showed 51% Ownership

"We made a survey last summer, employing 11 college and high school students who rang 11,000 doorbells. Of the 8,000 from whom they obtained answers, 51 per cent owned electric refrigerators."

But there is a brighter side to be told of Mr. Carpenter's survey. Asked what would be the next improvement for their home (new plumbing, redecorating, some type of appliance, etc.) most of those who gave an answer expressed a desire for some type of appliance, rather than a repair or addition to the structure itself. And refrigerators were high on the list of the appliances named.

Another interesting fact gleaned from this survey: average age of the refrigerators owned was 3 years.

Training Men for Dealers Has Helped, Claims Straus

D. H. Straus, Kelvinator distributor in Houston, Texas, has found that it pays dividends to provide his dealers with trained salesmanship.

Best way to provide this service for a dealer, Mr. Straus has found, is to have in the organization a personnel director who can go into a dealer's store on a minute's notice and set up a retail operation on electric refrigerators, complete with sales manager, salesmen, and a sales plan.

"We've got a man in our organization," says the Houston distributor, "who has such a wide acquaintance with retail salesmen in our territory that he can at any time supply a retail sales organization comprised of a sales manager and a half dozen or more men experienced in the refrigeration game to any dealer who might want them.

"This service is particularly valuable to a retail store of one type or another which would like to handle refrigeration, but is somewhat dubious about its ability to put together a sales organization to do the right kind of a job.

"This personnel director is also continually training new salesmen, and preparing experienced salesmen for executive sales jobs in retail setups."

Extra Cash for Salesmen

Mr. Straus believes that the most effective type of special promotion which a distributing organization can employ is one that provides extra compensation for the retail salesmen.

When a retail salesman knows that there is going to be some extra hard cash for him if he gets results within a specific period of time, sales managers can be sure that the salesman is going to tackle the job in his most aggressive manner, Mr. Straus believes.

The straight appliance dealer is still by far the most important factor in retailing electric refrigerators in the territory which is covered by Mr. Straus, although the types of retail stores handling electric refrigerators has been considerably extended in the past few years.

A big majority of the Houston distributor's best dealers handle Kelvinator on an exclusive basis—and some go even further than that and handle the refrigerator line as the exclusive product sold in their store!

Year-Round Business in Texas

It is possible for such dealers to handle refrigerators alone because of the distinctly year-round nature of the refrigeration business in that part of Texas.

"We've encouraged some of these dealers to put in other lines of appli-

ances, but many of them, after a few months' trial, have gone back to the policy of handling refrigerators only," says Mr. Straus.

Houston's year-round "summer season" makes it a good market for comfort cooling, Mr. Straus pointing out that some installations have their cooling systems in operation during February and March. Mr. Straus plans to put considerable emphasis on air-conditioning activities this year.

Kansas City Drive Showed Real Replacement Market

C. B. McElroy of Richards & Conover, Kansas City distributor, says that this organization found that there was a real replacement market when they went to work with the "Friends of Kelvinator" campaign, in which liberal allowances were granted for used Kelvinator models.

"We pulled names of 3,000 users out of our files," said Mr. McElroy, "and distributed them to the dealer nearest them, saving some out to be divided among the 'downtown' dealers. For the downtown dealers the cards were merely shuffled up and divided equally, with no regard for location.

"We sold new refrigerators to about 250 of these 3,000 prospects. Some of the refrigerators that we took in were 17 years old. Under the terms of the factory plan, all the old units taken in were junked, the dealers being allowed to keep only the motors."

Mr. McElroy's statements are of interest in that they show that a single distributing organization in one campaign sold better than 8 per cent of a definitely established replacement market.

Bitter Competitive Battle

Kansas City, believes Mr. McElroy, is one of the most bitterly competitive retail markets in the country. Nevertheless, competitive conditions were better in 1935 than in 1934, particularly with respect to maintenance of established list prices, this being due chiefly to the efforts of members of the Electric and Radio Association of Kansas City.

Not only within the industry is the competitive situation "hot," declares Mr. McElroy. The fight which the ice industry has been staging has been particularly "mean," he says.

Ice Competition No Worry

"Advertising by the ice people has charged that mechanical refrigerators dry out food, and that they won't last any length of time," he says. "But the ice people aren't worrying us very much, because we think they'll hang themselves if given enough rope."

There is no particular type of retail outlet which dominates in refrigeration selling in the Kansas City metropolitan area, says Mr. McElroy. In fact there is a great variety of retail establishments handling household electric refrigerators—music stores, furniture stores, automobile dealers, straight appliance dealers—and even drug stores.

Even Drug Stores!

This doesn't mean, Mr. McElroy was quick to emphasize, that sale of electric refrigerators has become strictly an over-the-counter proposition. Dealers who "go out after the business" are getting the big share of the business, he pointed out, and this is strikingly demonstrated by the activity of a type of dealer where you'd least expect it—the drug store.

The Katz drug stores, a chain well known in the Southwest, decided to sell electric refrigerators after handling a number of other electrical appliances. They took on Kelvinator and a couple of other well-known lines, hired an outside sales crew, kept them working day and night, set up a showroom in the basement, spotted another display near the main floor entrance, and have done a bang-up specialty-selling job, Mr. McElroy declared.

Built to PERFORM Smoothly!
Built to STAND UP for Years!
Built to Operate ECONOMICALLY!

COPELAND
 Commercial REFRIGERATION

YOU will find any Copeland Commercial Unit, taken off the production line at random, to be an outstanding example of engineering skill and precision manufacturing. It is a remarkably smooth running mechanism, because it is built to ultra-split-hair limits. Many special machining operations and many scientific tests assure exceptional accuracy of fit and alignment of moving parts. You cannot sell a more satisfactory line. A few territories are available. Write us.

COPELAND REFRIGERATION CORPORATION
Manufacturers of a complete line of Household and Commercial Refrigeration
 Holden Ave. at Lincoln . . . DETROIT, MICH.

Copeland
 DEPENDABLE Electric REFRIGERATION

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

WESTERN UNION

R. B. WHITE
PRESIDENT

NEWCOMB CARLTON
CHAIRMAN OF THE BOARD

J. C. WILLEVER
FIRST VICE-PRESIDENT

1220-S

SIGNS

DL = Day Letter
NM = Night Message
NL = Night Letter
LC = Deferred Cable
NLT = Cable Night Letter
Ship Radiogram

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on the date line, is STANDARD TIME.

Received at

ZG167 142 2 EXTRA=BUFFALO NY 13 407P
F M COCKRELL, ELECTRIC REFRIGERATION NEWS=
5229 CASS AVE=

MINUTES IN TRANSIT

FULL-RATE DAY LETTER

ALLOW US THROUGH THE COLUMNS OF YOUR FINE PAPER TO PUBLICLY CONGRATULATE GEORGE MASON AND THE KELVINATOR COMPANY ON JOINING THE RANKS OF THE PROGRESSIVES THROUGH THEIR ANNOUNCEMENT OF AIR CONDITIONING AND FROZEN STORAGE FOR THEIR SUPER DELUXE LINE FOR NINETEEN THIRTY SIX STOP HAVING OURSELVES SUCCESSFULLY PIONEERED THESE PRINCIPLES FOR THE PAST SEVERAL YEARS AND HAVING WON PUBLIC ACCEPTANCE FOR THESE PRINCIPLES FROM COAST TO COAST WE ARE PERHAPS IN A BETTER POSITION THAN ANYONE ELSE TO PREDICT A MOST SUCCESSFUL NINETEEN THIRTY SIX FOR KELVINATOR STOP IT IS OFTEN SAID THERE CAN BE NO LEADERSHIP WITHOUT FOLLOWERS THEREFORE IT IS WITH WHAT WE HOPE WILL BE TAKEN AS PARDONABLE PRIDE THAT WE SAY WELCOME TO THE FOLD STOP WE ARE SINCERELY GLAD THAT OUR FIRST DIRECT COMPETITION IS TO BE FROM A COMPANY OF KELVINATORS STANDING AND REPUTATION= T IRVING POTTER POTTER REFRIGERATOR CORP BUFFALO NY.

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office
Copyright, 1936, Business News Pub. Co.
Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.
Telephone Columbia 4242
Cable Address: Cockrell-Detroit
Western Union and Postal Telegraph Codes

Subscription Rates
U. S. and Possessions, Canada, and all
countries in the Pan-American Postal
Union: \$3.00 per year; 2 years for \$5.00.
All other Countries: \$5.00 per year.
Notice: Please do not pay money to
strangers claiming to represent this paper.
We employ no subscription solicitors.
Send orders and remittances by mail.

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor
PHIL B. REDEKER, Managing Editor
THEODORE T. QUINN, Assistant Editor
FRANCES McNAMARA, Assistant Editor
K. M. NEWCUM, S. L. PORTS, and
J. J. MURRAY, Contributing Editors

GEORGE N. CONGDON, Business Manager
ROBERT P. NIXON, Asst. Business Mgr.
HELEN K. GILMORE, Asst. Business Mgr.
R. T. CARRITHERS, Spec. Representative

JOHN R. ADAMS, Production Manager
JEAN H. ADAMS, Subscription Manager
LOLA E. DEW, Circulation Manager
WINIFRED MERSON, Spec. Representative

Member, Audit Bureau of Circulations
Member, Associated Business Papers

VOL. 17, No. 3, SERIAL No. 356
JANUARY 15, 1936
THIS ISSUE—31,000 COPIES

Demonstrations: Keynote of 1936 Selling Programs

WHEN a deaf-and-dumb man demonstrated the 1936 Stewart-Warner line of refrigerators to a convention of distributors, the keynote of this spring's merchandising campaigns was sounded. Each new line that has been announced has been accompanied by a merchandising plan evolved around a scheme for making the refrigerator almost self-demonstrating.

Stewart-Warner's idea is that of making the shelf arrangement so flexible and interchangeable that the prospect will enjoy rearranging it and changing it about herself.

It is a well-known psychological fact—one worked to the hilt by automobile and vacuum cleaner salesmen—that anything a person can feel and operate at once becomes interesting and worthy of further attention.

One of the chief complaints of refrigeration salesmen has been that prospects couldn't see the refrigerator operate, nor could they work it themselves. This new Stewart-Warner demonstration idea seems to answer that objection.

W. Paul Jones of Fairbanks-Morse agrees with John Patterson that most sales are lost because the salesmen forgot one or more points or features in his presentation. So he has worked out this novel presentation:

The 15 points to the Fairbanks-Morse sales story are each outlined on a separate star (which has adhesive backing). As soon as the salesman finishes telling about one point, he slaps the corresponding star on the front of the refrigerator.

Thus he must delineate each point in order to get rid of the 15 stars in his hand. Furthermore, each star sticks up in front of the prospect's eyes, so that she sees it—and keeps that point in mind as well as in sight—during the remainder of the demonstration.

Fairbanks-Morse is also counting heavily on the assurance that prospects will operate the Conservador with their own hands.

Sparton dealers have been given an accessory "card"—which holds each of the Sparton deluxe line features (like the anti-frost clock, the Kontainerette revolving dishes, the Baskador, and Baskadrawer) up for separate inspection.

This device is meant not only to help demonstrate the deluxe line, but to help dealers sell individual features to purchasers of a standard model.

Kelvinator is this year stressing proof selling, with proofs which the prospect can see.

Will the 1936 Kelvinator hold correct temperatures? Look at the built-in thermometer. Will it be economical? Here is a Certificate of Low Operating Cost from Electrical Testing Laboratories. Will it be trouble-free? Look over this 5-Year Service Protection Policy. And so on it goes, with visual proof for satisfaction of every fundamental question.

Art Scaife of General Electric has long been an advocate of visual selling, and has developed such devices as the Visualizer board, the Brooder, and slidefilms for home showings. Norge salesmen have their portable cut-away Rollator to show prospects. Westinghouse employs a glass-enclosed mechanism with good effect.

One good argument for demonstration merchandising is the high rate of turnover among salesmen, and the scarcity of well-trained salesmen in department stores. The idea is that the demonstration is so easy, so simple, and so self-starting that, in the classic words of Frank Hiter at the conclusion of the deaf-mute selling demonstration at the Stewart-Warner convention, "any dumb so-and-so can sell it!"

An even better reason is the known importance of seeing and feeling in the inducing of human acceptance of, familiarity with, and affection for—anything new.

"Quoted"

New Deal Costs and the High Cost of Living

[From an address by Gilbert H. Montague before the Academy of Political and Social Science at Philadelphia, Nov. 29, 1935.]

UNTIL recently no responsible section of American political, economic, or social thought would dispute the axiomatic proposition that the task of industry in American life is—To provide the American people with goods and services in quantities and at prices that will permit a steady rise in the American standard of living, and—

To provide the American people with gainful employment in numbers and at wages and under conditions that will insure the same steady rise in the American standard of living, and—

To provide the American people with opportunities for investment and for receiving a return upon such investment . . .

More recently under the New Deal an idea has been developing that there must now be laid upon industry a new task, calling for a fourth function wholly different from any of its original functions, and that these three original functions must now be subordinated to this fourth function, by which the government shall require industry—

To serve as a vehicle for bringing about far-reaching reforms in American social life at the expense of industry's ability to provide the American people with goods or services or employment or opportunities for investment.

Already a considerable number of American industrial corporations pay taxes annually in excess of one dollar for each \$20 market value of each share of their stock valued at present inflated stock exchange valuations.

These taxes are paid by all producers and distributors, and like other elements of their costs are included in their selling prices, and as goods pass through one market from one seller to another until they reach the consumer each seller figures his sales price on the basis of a percentage mark-up over what he has had to pay to the previous seller.

Colossal as are these amazingly increasing taxes, and enormous as are the increasing costs which they are adding to the prices of all goods that make up the cost of living of consumers throughout the United States, these taxes still fall short of meeting the current expenditures of the government by billions of dollars per annum . . .

Federal government expenditures in excess of receipts from taxes have in three years produced deficits in the federal budget that aggregate the stupendous sum of almost 11,000 million dollars . . .

Letters

Municipal Ordinance To Control Service

Valley Refrigeration Supply Co.
Youngstown, Ohio

Publisher:

Our local officials are interested in passing some kind of an ordinance or license law pertaining to the installation of refrigeration equipment.

We already have a code which was passed by our council a number of years ago but to which very little attention is paid.

Will you kindly send us such information as you may have on these matters, and suggestions as to how it should be prepared and presented to our city council.

I believe you have reported the presentation of various ordinances in your columns as well as the questions raised by councilmen during their presentation and that you can send us some information concerning ordinances now enforced in other cities.

The licensing ordinances as proposed here would require the present refrigeration contractors as well as any others who may enter into the business to pass an examination which would determine their fitness to properly install and service refrigeration equipment. It would require a sales company to employ a licensed contractor to do their installation work in accordance with the code unless they are of sufficient size to keep a licensed man on their pay roll.

This condition has been brought about due to the fact that recently some air-conditioning equipment has been sold which is the first to go in Youngstown outside of what is now installed in theaters and public buildings, which equipment is all high pressure.

We will gladly pay you for any extra copies you may have to send us, or such other charges you may find it necessary to make providing it will not run over \$5.00.

E. S. WRIGHT.

Answer: As soon as possible we will make a collection of local municipal ordinances which may be available in our files or in previous issues of the News.

For example, we have just been informed regarding an association which employed an attorney to draw up an ordinance which would require a license, bond, and three years experience to qualify for refrigeration service work. The association paid an attorney \$250 to draw up the ordinance.

No doubt such expense is being duplicated in other cities scattered over the country and the situation indicates that there is a need for some central advisory service on problems of this kind.

We would like to say that the News will undertake this job for the benefit of all concerned, but, at this season, our editorial program is so full that it does not seem possible to undertake a comprehensive survey.

Correspondence is invited from others who are interested in preparing a local ordinance, or who have had experience along that line.

Misleading Effect Of Selected Clippings

Refrigeration Engineering Institute
Youngstown, Ohio

Publisher:

I am writing you to find out what arrangements can be made with your paper for reprinting in the Student News of the Refrigeration Engineering Institute some of the articles which show the great increase in the refrigeration and air conditioning market.

I would also like to have permission to use some of the statistics that your newspaper has compiled on refrigeration and air conditioning field. This material will be printed in a catalog which we are compiling at the present time.

I am enclosing a copy of the student news publication for your approval.

REFRIGERATION ENGINEERING INSTITUTE.
Answer: We cannot give blanket authorization to reprint copyrighted material from ELECTRIC REFRIGERATION NEWS.

If you will make up a layout showing the material which you desire to reprint, send it to us, we can quickly determine our attitude regarding such specific material.

Since our own policy is to print the bad news as well as the good, the reader of the paper gets a very reliable picture of the actual condition of the industry and its opportunities for the future. When certain material is clipped as suggested, the tendency is to select only such items as are highly favorable and the result may be a serious distortion of the actual facts.

"I have taken your magazine for years and always find it very helpful."—Gordon L. Bleich, 1219 Norfolk Ave., Norfolk, Nebr.

They Speak No English But Read the News

Melchior, Armstrong, Dessau Co.
48 Zuyder Amstellan
Amsterdam, Netherlands

Mr. Taubeneck:

I was indeed very pleased to hear about your plans of making a trip abroad for the purpose of having a peep around in other refrigeration markets. I think it is an excellent idea and I am sure your trip will have its influence on the paper, though I cannot see very well how you could improve the News.

I think you'll be surprised to learn how many faithful friends you have abroad. I have known engineers, who did not speak English, but who with the aid of a few lessons and a dictionary managed to get all the education they needed out of your paper. It therefore would be excellent if you could talk with these friends in their language, and in this respect some French and German would be very useful.

I hope you'll let me know about your schedule some time ahead, so that I can match it with my plans, meeting you either in Paris, Brussels, or Amsterdam as preferred. Please note, that after January 15 I am changing my European Headquarters and from that date my address will be: 70 Heemsteedsche Dreef, Heemstede (Netherlands).

I am looking forward towards your visit over here, and you can rely on me for any assistance you may require.

HARRY G. NOORDBERG,
European Sales Manager

A Welcome from Weber

Weber Showcase & Fixture Co., Inc.
5700 Avalon Blvd.
Los Angeles, Calif.

Editor:

I have just read in your January 1 issue of the "Round the World" trip your representative is now starting and wish to extend a very cordial invitation to him and his companions to visit us in Los Angeles before sailing for the Far East.

It is seldom that we have an opportunity to meet representatives of your publication and we are sure that we have numerous matters which would be very interesting to them.

From our standpoint, we are most anxious to make them as familiar with the Weber organization and products as possible as we are expanding our foreign markets very rapidly and are quite sure that such a visit would be mutually beneficial.

I trust that Mr. Taubeneck will get in touch with us on his arrival here.

MARK ALLEN,
Assistant Sales Manager.

Help to Export Business

P. M. Mahler & Co., Inc.
Foreign Sales Managers
80 Broad St.
New York City

Editor:

This letter is written you in appreciation for the many interesting news items which we have found in your magazine during 1935.

We believe that your publication is particularly helpful in developing a large volume of export business on behalf of the group of manufacturers whom we represent as export managers.

P. M. MAHLER, President.

More Requests for the Catalog Service

"I would like to be placed on your mailing list to receive catalogues and trade literature from manufacturers. We have been in the refrigeration business about six years.

"For your information am ordering the MASTER SERVICE MANUAL from my Jobber. Also have been a subscriber to your paper for the last five years."—Herman H. Bender, Installation & Service Mgr., Bender Electric Co., Carrolltown, Pa. (Frigidaire dealer).

"I notice in your issue of Dec. 11 that you are completing a catalogue mailing list. Will you kindly add my name to this list and oblige."—James Gibson, Electric Refrigeration Mechanic (Service & Installation on All Makes), 459 Stiles St., Winnipeg, Manitoba, Canada.

"I am a subscriber to the News and would appreciate your adding my name to the mailing service you are forming. Thank you."—W. C. Lancaster (Electric refrigeration service, installation, and repairs), 1688 Lafond St., St. Paul, Minn.

"May this notify you of change of address. Hereafter please address my copies of the News to the address below.

"Would also like you to register me on the catalogue mailing list, and independent service men list. Thanking you very much."—Bruce E. Mercer, 404 S. Eighth St., St. Joseph, Mo.

"Please add my name to the catalogue mailing list that you are preparing. I have been a News reader for several years and think it is better all the time."—Graham R. McLay, Service Manager, 323 S. La Brea Ave., Los Angeles, Calif. (Frigidaire dealer).

Comment

By F. M. Cockrell

On His Way Around

Well, George Taubeneck finally got himself packed up and on his way around the world. The official start was made at the Kelvinator distributors' meeting in the Wilson theater, Detroit, last Wednesday afternoon at 2:30 p. m.

Vice President Henry Burritt introduced him to the audience of more than a thousand in the far-famed Burritt manner. George told the story about "the cat and the dish," got a cheer from the crowd, and made his getaway.

As we came out of the theater entrance, George Mason and H. G. Perkins arrived in a taxi. I had a camera and quickly took half a dozen shots as they said goodbye to George. Later on, discovered that I had forgotten to set the distance dings and that my two best shots were a double-exposure.

Candid Camera Practice

Evidently I will have to do a lot more practicing before I will be able to get those candid camera action pictures which George has been taking in such quantities during the past two years.

I remember, however, that he ran up some staggering bills for film and developing at the Eastman Co. for several months before we had any passable pictures for publication.

At one time, I called a halt on the expense and told George flatly that I thought it would be cheaper for the News to hire the full-time services of a professional photographer. I had an idea that those little pictures in the News were costing about \$10.00 apiece.

He argued the matter, got all of the figures together, and proved that the average was only \$1.80 per picture published, or something like that (not including the cost of engraving, of course).

Eating Isn't News

But the cost of film was only part of my complaint. The captions, it seemed to me, were terrible.

Most of the early pictures were taken at banquets and so a large percentage of them showed refrigeration men in the process of consuming nourishment.

Since it required about 100 per cent of the cameraman's time simply to get the pictures, he had little opportunity to find out what the subjects were doing or talking about.

After the film was developed and a few good shots picked out of a hundred poor ones, the editorial department had another imposing problem of getting the names straight.

By the time they got over that hurdle, they were usually exhausted, and the captions usually ran to such inanities as: "A. G. Blechler sips the soup, Louis Ruthenburg opens an oyster, P. B. Zimmerman butters a biscuit, etc."

A Tough Assignment

After a while I put it up to the department to try and write captions which would interpret what the subjects were thinking or talking about, or at least what they ought to be thinking or talking about under the circumstances.

That proved to be a tough assignment. In fact, we haven't found the answer to the problem yet, but I believe that we are making some progress.

Now here is a little bit of serious philosophy which has come out of all this experience since George has been taking candid camera pictures all over the refrigeration industry.

Do Executives Work?

Has it ever occurred to you that one reason the general public does not understand the aims and purposes of big business is that they never have an opportunity to see business executives at work?

Before the advent of the candid camera, the only action pictures taken of prominent business men, and published in the newspapers, were usually taken outdoors.

The big chief was shown playing golf, riding horseback, aboard a yacht, attending the races, or indulging in some sport or pastime.

As a natural result, the newspaper reading public acquired the impression that the big shots of industry never do any work, but devote themselves to the good things of life, while the hired hands are sweating in the factory.

(Concluded on Page 26, Column 5)



It's Here!

A Great Product with a Great Program

The "Hot Line"

THESE MAKE LEONARD THE Sensational

55 years of experience in building refrigerators...find expression in - new beauty - new convenience - new measure of value.

Months ago Leonard engineers and designers determined to produce for 1936 the finest, most complete, most attractive, most serviceable refrigerator that had ever been built.

Thousands of owners and prospective purchasers of mechanical refrigerators were interviewed and their suggestions carefully considered. Home economists were consulted. Inventors and designers were brought in.

The result is the new Leonard—the Sensational Refrigerator of 1936.

Study the features illustrated on these pages. Study the exterior design. Here is beauty never before achieved in a refrigerator. But it is more than beauty. Leonard is wider, so that you do not have to reach far back on the shelves. Every dish, every article is instantly available.

Note the large new Len-a-Drawer for vegetables,

and the convenient shelf on the door, that folds up when the door closes. Note the temperature indicator that tells the temperature in the food compartment every minute of every day. Note the Len-a-dor pedal that at the touch of a toe swings the door open. Here is every convenience that modern refrigeration has known and many that are new, combined in one refrigerator.

Then consider this. Leonard is backed by a 5-year



Unquestionably, the most
strikingly beautiful
refrigerator ever built!

BEFORE YOU BUY

for 1936!

REFRIGERATOR OF 1936

Protection Plan, insuring its continued dependability. Leonard has an efficient mechanical unit utilizing a new and better refrigerant—Freon—and costs even less to operate than the efficient refrigerators of former years.

If you could consult thousands of refrigerator owners and then have built for yourself the one refrigerator combining all desirable features or conveniences, design, economy, and dependable operation, the refrigerator you would build would be the Leonard of 1936.

And with all these features, Leonard costs you no more than an ordinary refrigerator and can be purchased on terms by which it more than pays for itself.

LEONARD REFRIGERATOR COMPANY, DETROIT, MICHIGAN



TEMPERATURE INDICATOR. The most revolutionary forward step in refrigeration—constant assurance of safe temperatures. *THE CHILL-O-METER* gives you 13 different speeds for freezing ice cubes, salads and desserts.



FIVE-YEAR PROTECTION PLAN. The new Leonard comes to you backed by a 5-year Protection Plan, signed by the manufacturer. This is absolute proof of the maker's confidence in the dependability of his product.



SLIDING SHELF. A shelf which pulls out like a drawer, making every article instantly available. Cannot tip over. Especially helpful for keeping individual dishes cold until ready for serving.



SERVICE SHELF. A handy drop-shelf on the door, available in an instant, for preparing iced drinks, rearranging the contents of your refrigerator, serving salads or frozen desserts.



CRISPER. A handy drawer where fresh, green vegetables are kept moist, crisp and delicious. Even such things as wilted lettuce or celery, placed in it, quickly regain former freshness.

LEN-A-DRAWER. A roomy, drawer-like compartment for safe storing of vegetables which do not require low temperatures. Slides easily on rollers and cannot stick or fall out.

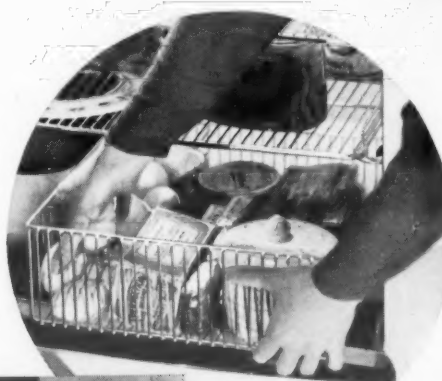


THE LEN-A-DOR. A time-saving pedal which opens the door at a pressure of your foot. Both hands are free, when you use the Leonard.



ICE CUBES INSTANTLY. From a flexible rubber grid you can lift out dry, cold, full-sized cubes. By completely flexing the grid, all the cubes pop out.

INTERIOR LIGHT. When you open the door of a Leonard, an interior electric light snaps on, automatically. When you shut the door, it goes out. Every inch of the interior of the cabinet is clearly visible.



UTILITY BASKET. A simple little wire basket for holding fruits, vegetables and small articles which require refrigeration. Keeps oranges and lemons from rolling, and saves space.

SEE

Leonard

THE SENSATIONAL
REFRIGERATOR OF 1936

Ready Now!



The
STAGE
is
Set

LEONARD

The "Hot Line" for 1936

When the Leonard distributors saw the 1936 line . . . heard the 1936 program of advertising and sales promotion . . . they just about raised the roof of the convention hall.

They recognized a great product and a great program. They were never so enthusiastic. They never gave a product or an idea such acclaim.

A great product . . . because it gives the public more of what it wants than any other refrigerator . . . because it has been designed, built and equipped to make an instant appeal to those who want the biggest value for their money.

A great program . . . because the advertising is sensational—geared to produce buying action—not just passive acceptance. Because the sales

plans, promotional activities, literature and dealer helps, all are keyed to the highest pitch.

And—both product and program come from an old, reliable, substantial company, a company with years of refrigeration experience, with a high reputation, strong financial backing, and resources that make it one of the leaders in the industry.

Leonard—its distributors, dealers and salesmen—will write new refrigeration history in 1936. Climb aboard the Leonard bandwagon this year.

Leonard's the "Hot Line"! It's going places.

LEONARD REFRIGERATOR COMPANY, DETROIT, MICHIGAN

LEONARD

The Sensational Refrigerator of 1936

Sales Idea of the Week

By V. E. (Sam) Vining

If you want anything—even an order—ask for it.

I had that proved to me as a kid by no less a person than John Philip Sousa.

I was a glorified freshman at Ohio Wesleyan University. And if you think I wasn't "glorified," you just don't own a dictionary.

Visualize me, if you will, in peg-top corduroy pants with leather cuffs three inches deep, high heeled "bull-dog" button pumps, a flannel shirt with a Winsor tie, a hat with a shoe string interlaced through its one-inch rim, a fraternity pledge button that seemed to me as big and as important as a policeman's badge.

And brother, you have visualized something.

Then came Sousa. He played in the "Opry House."

I can see him yet as he stood with his erect military figure before his band—playing, it seemed, not so much on instruments of wood and brass as on the heart strings of those under his spell.

He played "El Capitan."

The world became a thing of dreams for me. I forgot the crowds around me, Sousa himself disappeared, physically I myself ceased to exist. I lived only in a land of awful emotion—despair, love, hope, life's futility—all on parade.

Then Triumph—

And as Sousa's baton swept downward with the last beat of the music I found myself standing—standing alone before all the world—stripped of all except the knowledge that the music could not—must not cease. And in the silence that preceeds a storm of applause, I yelled:

"Oh, please, play it again."

The audience cheered and howled and laughed and stamped its feet not only at my enthusiasm, but at the confusion which overcame me when I realized what I had done.

But—Sousa,

Turned around and bowed to me with that wonderful sweet smile that has lived in my heart for years, and—

Played it again.

Kelvinator Executives Explain Sales and Advertising Plans for 1936

DETROIT—Kelvinator Corp. has geared its production, sales plans, and pricing on a sales expectancy of 100,000 more household electric refrigerators and 10,000 more commercial refrigeration units in 1936 than the company sold in 1935.

That's what Kelvinator distributors, in convention here last week, were told by George Mason, president of the company, and Henry W. Burritt, vice president in charge of sales.

Mr. Mason explained to the distributors that while Kelvinator sold more units in 1935 than in any other year of its history, he considered 1935 only an "ordinary" year from the standpoint of the sales volume that might possibly be achieved. All business indexes and indications, he continued, point to 1936 as holding possibilities of phenomenal sales for all lines of business and the refrigeration industry in particular.

Kelvinator's selling program and sales promotion this year are to be built about a "proof selling" plan, based on a series of eight questions concerning the refrigerator, on which the prospect should satisfy himself. These questions were enumerated in Editor George Taubeneck's story in last week's issue of *ELECTRIC REFRIGERATION NEWS*.

B. B. Geyer of Geyer, Cornell & Newell, Inc., Kelvinator advertising agency, declared that these questions were gleaned from an extensive survey of users, prospective users, and retailers of household electric refrigerators.

Of the users surveyed, 6,742 per cent indicated a desire to replace their present unit, which reveals a replacement market of 480,000 units, Mr. Geyer stated.

Also demonstrated by the survey, claimed Mr. Geyer, was the fact that the biggest single selling point on electric refrigerators is the recommendation of a user. This explains why much of the 1936 Kelvinator advertising copy will be directed at users, with the thought that non-owners will be "looking over the shoulder" of present users.

Appropriation for national magazine advertising is double that of the money spent in 1935, Mr. Geyer stated.

Kelvinator's 1936 advertising campaign will break with a five-color, five-page advertisement in the Feb. 22 issue of the *Saturday Evening Post*. This advertisement will also appear in the March 16 issue of *Collier's*. Page advertisements will be used

in *Good Housekeeping*, *McCall's*, *Woman's Home Companion*, *American*, and *Liberty* magazines.

A newspaper campaign will be run in a number of key cities.

Expenditures by Kelvinator Corp. for cooperative newspaper, billboard, and radio advertising this year will exceed by \$300,000 the expenditures for similar purposes last year, Mr. Geyer declared.

Advertising plans for the Super Deluxe line call for copy which will

Distributors Sign Orders For 58,080 Kelvinators

DETROIT, Jan. 13—Mercantile distributors for Kelvinator Corp., following the convention here last week, ordered 58,080 new 1936 Kelvinator household electric refrigerators, Henry W. Burritt, vice president in charge of sales, reports.

This figure compares with total orders of 29,908 units placed by the same group for the entire first quarter of 1935.

The entire distributing organization placed orders for Kelvinator household electric refrigerators for shipment during the January quarter amounting to \$12,500,000 in retail value, Mr. Burritt declared.

be trained on the replacement market, with advertisements to appear in *Fortune*, *Esquire*, *Time*, *New Yorker*, *House & Garden*, and *House Beautiful*. Walter Jeffrey, domestic advertising manager, outlined the sales promotion literature, floor display, window display, and sales-training plans that will be in effect this year.

All sales promotion pieces such as line folders, salesmen's literature, envelope stuffers, etc., will tie-in very closely with the national advertising copy, to enable the field organization to get the full advantage of the national magazine campaign.

Local identification (outside and display window signs) will be strongly urged on all dealers this year, Mr. Jeffrey said. Cost of the signs will be split among distributor, dealer, and factory.

All of the factory-designed window displays this year are to be animated. Dealers subscribing to the display service will get an electric motor to operate such displays.

In its sales-training plans, Kelvinator has greatly simplified its home study course for retail salesmen, so that the salesman will not be frightened away from the course by a ponderous amount of material.

As an innovation in its sales-training program Kelvinator will inaugurate a "Pioneer Club" which will afford recognition for outstanding retail salesmen.

The following 75 men, winners in a prize contest for wholesale men, were presented with Elgin traveling clocks at the Kelvinator convention banquet Wednesday night:

H. M. Blount, Greenville, S. C.; J. H. Langrall, Richmond; L. S. Black, Phoenix, Ariz.; C. L. Ferguson, Fresno, Calif.; C. L. Reddish and H. E. Brasler, Los Angeles; P. D. Lago and V. P. William, San Francisco; D. L. Thornley, Salt Lake City; O. A. Kennedy, Amarillo, Tex.; F. L. Bowron, Casper, Wyo.

R. E. Woodmansee and E. H. Ross, Kansas City; W. C. DeBolt, Omaha; Max Van Hook, Springfield, Mo.; Ted Terry, Dallas; A. G. Riddiok, New Orleans; J. A. Bertha, Houston, Tex.; J. A. Lee, Shreveport, La.; G. H. Shanks, Knoxville, Tenn.; F. D. McCoy, Little Rock, Ark.; W. J. Noriss, Memphis.

D. L. Harper, Minneapolis; R. H. Kelley, Sioux Falls, S. D.; W. L. Gar-

rett, Clarksburg, W. Va.; A. H. Warne, Hagerstown, Md.; H. L. Tangert, Pittsburgh; W. A. Dorsey, Wheeling, W. Va.; D. L. Brillhart, York, Pa.; A. P. Livingston, Pottsville, Pa.

H. A. Wilson, Huntington, Ind.; W. A. Clauss, Cincinnati; H. L. Heinzelman, Columbus; Donald Delbrook, Indianapolis; C. M. Marshall and D. D. Fuller, St. Louis; John Banks, W. V. Carroll, and C. Down, Brooklyn; H. Lasky, E. Hutelmyer, and M. Berger, Philadelphia.

Dave Wagman, D. E. Scott, and Jack Mendelson, Newark; L. C. Savage, Cleveland; B. W. Place, South Bend, Ind.; W. P. Ballinger, Kalamazoo, Mich.; H. J. Mitchell, Seattle; C. H. Hammer, Spokane; E. W. Jenkins, Boise, Idaho; C. W. Death, Jacksonville, Fla.; M. W. Baird, Tampa, Fla.; R. T. McAllister, Miami, Fla.; R. B. Walker, Atlanta.

A. J. Seyfert, Green Bay, Wis.; B. F. Burkholz, Milwaukee; K. A. Adams, Peoria, Ill.; C. E. Plumly, Davenport, Iowa; J. C. Dellinger, Gastonia, N. C.

W. J. O'Brien, Albany, N. Y.; M. L. Hagle, New Britain, Conn.; J. L. Mulraney, Providence, R. I.; F. A. Piron, Syracuse, N. Y.; Cash Lauferweiler and Joseph Dohany, Buffalo; J. L. Crowley and C. A. McCleary, Boston; R. C. Lemon and C. K. Godfrey, Chicago; A. R. Shaw and J. W. Taylor, Detroit.

Carrier Corp. Opens Sales Convention

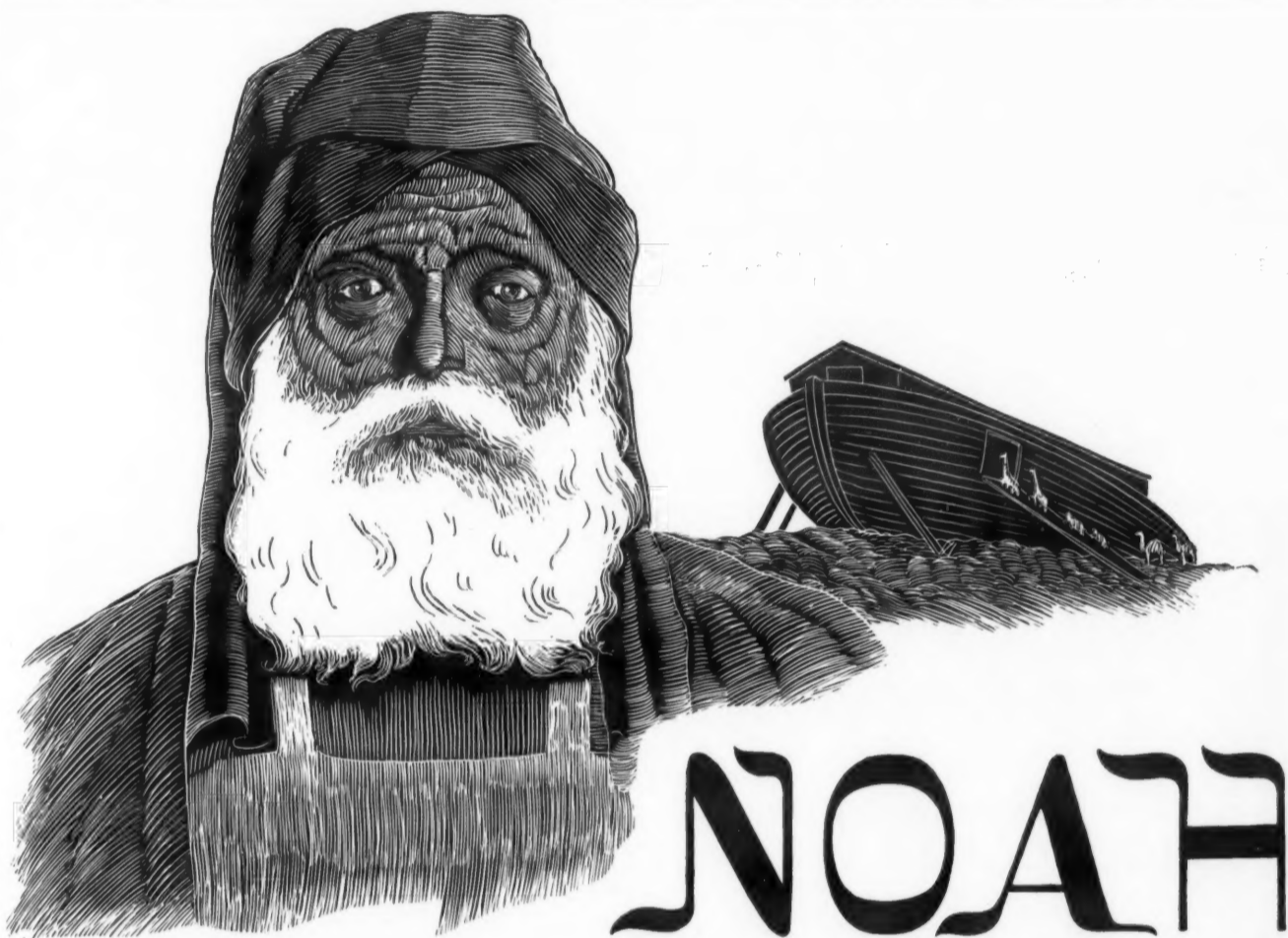
NEWARK, Jan. 14—Five hundred air-conditioning dealers and engineers from all parts of the country are attending the annual sales convention of the Carrier Engineering Corp. which opened yesterday at the corporation's plant here.

Carrier's field organization heard of bright prospects for increased air-conditioning sales in 1936 and the announcement that the dealer division of the company had increased its sales 83 per cent in 1935.

Field reports indicate increasing purchases of refrigeration units by food-processing plants as the result of the Supreme Court decision on the A.A.A. J. I. Lyle, president of the company, predicted a heavy increase in comfort air conditioning for stores, restaurants, offices, and the beginning of a real demand for home air conditioning.

The convention will last until Saturday, comprising engineering and sales meetings covering various phases of the air-conditioning industry.

In addition to the Carrier dealer organization, engineers and salesmen from all the direct offices of the corporation were present.



rated a Pair over 3 of a Kind

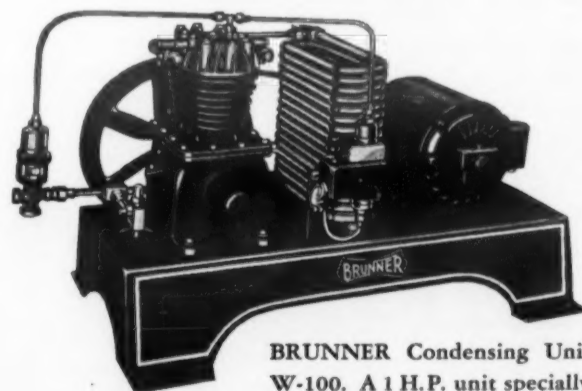
In making up the list for his nautical excursion, Noah carefully avoided all excess baggage. His sailing companions were selected on the basis of potential usefulness.

This policy of Noah's finds its counterpart in the way Brunner plans and builds refrigeration units. Ruling out all excess—avoiding bulkiness and useless weight—Brunner accomplishes what the industry is looking for: compactness... attention-free performance... economy.

There's a unit among Brunner's 8 Compressor models and 41 Condensing Units which can answer any specific set of demands you might name: from 1/6 H. P. to 15 H. P.; air and water-cooled; electric motor

or gas engine driven. Complete information and specifications in the Brunner Refrigeration Catalog. Send for a copy. Brunner Manufacturing Co., Utica, N. Y., U. S. A.

BRUNNER



BRUNNER Condensing Unit W-100. A 1 H. P. unit specially suited to large display cases... water-cooled... economical.

BRUNNER
Hightsides and Compressors

Air Conditioning

Frick Conditioners Used in Statler's New Buffalo Bar

BUFFALO—The Lounge Bar in Hotel Statler here, last of the new bars to be completed by the hotel chain, has been equipped with Frick air-conditioning and Temprite beer-cooling equipment.

The installation was made by Mollenberg-Betz Machinery Co., Frick distributor for Buffalo and vicinity. Beer-cooling equipment includes four model 25-B-2 Temprite coolers, with a 3-hp. Frick condensing unit.

Design of the lounge is modern throughout. Two large gilt columns frame the doorway leading from the hotel foyer, and the floor is carpeted in a shaded block design of coral and copper. Walls are wainscoted in amber satinwood, and are covered above with coral leather, overlaid with strips of gold in a block design.

Mirrors are placed at intervals throughout the room, and there are several gold pilasters running from floor to ceiling. The latter is done in gold leaf, with a large domed area in the center, from which flows a glow of light and color, from reflected illumination. Degree of light can be controlled according to the hour of the day.

The bar is horseshoe shaped, paneled vertically with bands of satinwood and black, with divisional bands delicately carved and gilded. This end of the room has two mural panels in gold by Glen M. Shaw.

Above the room, on the principal walls, are built-in wall benches, cushioned in coral leather. Tables are of curly grained wood, with brass mounting.

Utility Booklet Tells How Conditioning Is Used in Baltimore

BALTIMORE—To interest commercial firms in air-conditioning equipment, the Gas & Electric Co. of this city has issued a booklet titled "Air Conditioning Serves Baltimore." It reveals the extent to which air conditioning is being used in this city, gives the names of firms so equipped, and includes pictures of each type of commercial enterprise which installed systems.

Total number of installations for Baltimore up to July, 1935, is 173. Units are installed in 30 theaters, 29 offices, 20 restaurants, 16 drug stores and confectionery shops, 10 food stores, 10 hospitals, and 10 specialty shops, the booklet states.

There are nine industrial air-conditioning installations operating in Baltimore, the analysis of the market shows. Eight department stores are air cooled. Other installations are in seven banks and trust companies, seven beauty and barber shops, three public buildings, and other installations include those in funeral houses, clubs, community halls, and a radio station.

Photographic reproductions of store and building interiors, pleasing typography, and narrow margins which carry the blue and white sky scene motif on the cover, onto each page, enhance the appearance of this little booklet. Copy at the end of the book contains reproductions of letters from air-conditioning users.

The utility offers technical counsel on industrial or personal air-conditioning to merchants or professional men.

York Introduces New Line of Industrial Air Conditioners

YORK, Pa.—A new line of industrial air-conditioner units, designed to meet a wide range of industrial air-cooling requirements, is being introduced by York Ice Machinery Corp.

The new models, designated as FB-500, FB-800, FB-1400, and FB-2000, can be installed in any industrial plant, with or without distributing ducts. They are designed to insure uniform and continuous distribution of air at correct temperature and humidity for specific industrial needs.

Furnished in either the high or low pressure type, the York automatic float control permits automatic control of the refrigerant, whether ammonia, circulating brine, or cold water is used. Where circulating brine or cold water is used as a refrigerant, special coils and headers are furnished.

The new conditioners are built in a sufficiently wide range of sizes to meet every requirement of capacity and temperature. Each unit has a definite guaranteed rating. Savings in space and refrigeration are claimed for this compactly built unit, due to the low head room of the models.

The entire unit is enclosed in heavy steel casing, fully braced. Fans are of the quiet-operating, multi-blade, double-inlet type, providing low outlet velocities, with V-belt drive to insure flexibility of speed.

All coils are of 3/4 in. full weight pipe, bent from single lengths, and fabricated into all-welded units. After bending, the coils are annealed.

All coils are thoroughly tested under water, both before and after galvanizing, to insure absolute gas-tight construction. These coils are specially designed for high efficiency under flooded operation, and the internal resistance is held to a minimum to adapt them to ammonia float control.

Automatic control of room temperature at any desired level is accomplished with these conditioning units through thermostatic regulation of the refrigerating operation, or where the units are connected with a central refrigerating system, by controlling the flow of the refrigerating element.

45 Installations Made In PG&E Territory

SAN FRANCISCO—One hundred forty-five installations of air-conditioning equipment were made in the territory served by Pacific Gas & Electric Co. during the first 10 months of 1935, reports R. S. Fisher, vice president of the utility in charge of public relations and sales.

This compares with 462 installations of conditioning equipment in the years prior to 1935, and brings the territory's total to 607, with a connected horsepower load of 4,685.

Three installations of 50 hp. or above featured this year's business, Mr. Fisher reports. They were El Campanile theater, Antioch, a system of 75 hp.; T&D Enterprise theater, Chico, 50 hp.; and Hale Brothers department store, Sacramento, 196 hp.

Domestic air-conditioning installations totaled 64 during the 10-month period, with an aggregate of 38 hp. At the same time, commercial installations were 81, for a total horsepower of 722.

Use of conditioning equipment in the PG&E territory to Nov. 1, 1935, is indicated by the following table:

	Installations	Horsepower
Previous to Jan. 1, 1935	462	3,925
First 10 Months, 1935	145	760
Total	607	4,685

Neisner Bros. Conditions Rochester Branch

ROCHESTER, N. Y.—That air conditioning is a million dollar asset in a five-cents-to-\$1 store might be deduced from the experience which Neisner Brothers, Inc., branch in this city has had since it installed a Westinghouse air-conditioning system.

Both customer comfort and heightened selling activity of personnel, due to the air-conditioned surroundings, helped this store to make a large volume increase in units and dollars, states Joseph M. Neisner, president of the chain store organization.

The basement, main, and second floors of this store are conditioned. Two large vents on the main floor carry the washed, filtered, and cooled air from the equipment. Six vents circulate the cooled air on the second floor, and a similar number withdraw stale air.

Regulation of the air supply in the basement is performed by means of vents directly connected to the cooling chambers. The complete system has been adapted to the circulation of warm air during cold seasons.

Because air conditioning proved so profitable in the Rochester store, a Neisner branch recently opened in Cincinnati has been similarly equipped.

New Ceiling Hides Air Ducts



One of the problems facing Interstate Electric Co. engineers and Kelvinator engineers was the installation of air-conditioning ducts in the shallow space between the floor beams and the tops of doorways in one of the hallways in the City Bank building, Shreveport, La. Cross members for a new ceiling which completely hides the ducts are pictured above.

Design Conditions of Building Overcome In Air-Conditioning Installation in Bank

SHREVEPORT, La.—The 100-ton system installed in the City Bank building here by the Interstate Electric Co., Kelvinator distributor here, is said to be the largest installation of Kelvinator equipment made to date.

Equipment consists of five WV6200 condensing units, each with 20-hp. capacity, and 10 CA600DC suspended-type air-conditioning units. Conditioned air is supplied on 10 floors of this 12-story building through installation of an air-conditioning unit on each floor.

Application of air conditioning to this building was complicated by 28-in. wide concrete beams which hung below the ceiling in each hall. To overcome this difficulty, engineers designed shallow ducts which were installed in the space between the beams and the doorways' tops. These are completely concealed by a low, curved ceiling, built after the ducts were installed.

Automatic control for each unit is

supplied by a thermostat and a humidistat located in the return air ducts. Outside air connections are provided on each floor. A cooling tower and circulating pump are located on the building's roof.

To reduce the sun load, the ceiling on the twelfth floor of this building has been insulated with 3 in. of rock wool. Tests made after the installation was partly completed showed that with a dry bulb temperature of 92° outside, it was possible to maintain a dry bulb temperature of 76° inside the building. Wet bulb readings on the same day were 78½° outside and 64° inside.

R. A. Querbes, president, and J. A. Lee, refrigeration department manager of Interstate Electric Co., sold the equipment for the installation. The system was designed by J. W. Baugher of Kelvinator air-conditioning applications department, while H. H. McGeehee assisted in the installation of the equipment.

New Process Used in Glass Filter Making

NEWARK, Ohio—Glass air filters, for use in ventilating and air-conditioning systems, have been developed by the industrial materials division of Owens-Illinois Glass Co. at its plant here.

The filters are made by means of a new process, in which glass fibers the size of broom straw are assembled into 2-inch thick mats, and sprayed with an odorless, non-evaporating chemical adhesive.

It is claimed that use of these filters in heating and ventilating equipment will purify the air diffused into a room, so that walls and decorations no longer need be stained with dust-laden heat. Besides this, tests made by company employees indicate that hay fever sufferers are given definite relief in rooms supplied with air through glass filters.

This new product, placed in the ventilating equipment of industrial concerns, will protect combustion engines and machinery against abrasive dusts that lead to costly repair and replacement, it is claimed.

Another product developed through this new Owens-Illinois process is a glass wool, which may be used as insulation material in homes. It is a downy substance, manufactured in sheets, and is claimed to be fire, vermin, and moisture proof.

Application of glass wool as an insulation material is said to keep rooms warmer in winter and cooler in summer. Because glass insulation does not allow the warm air to escape, heating costs in a home so insulated are said to be reduced from 30 to 40 per cent.

Business of Coffee Shop Doubled by Installation Of Air Conditioners

AUGUSTA, Ga.—Dollar volume of business more than doubled in the S. & S. Coffee Shoppe, "Augusta's only air-conditioned restaurant," as the result of installing Kelvinator air-conditioning equipment, reports Roy Scarborough, the owner.

"The cost of the installation and the expense of operating the equipment have been more than justified by the phenomenal increase in business which occurred contemporaneously with the adding of air conditioning," Mr. Scarborough states.

"The dollar volume of my restaurant business more than doubled during the past summer, and I am confident that the comfortable interior of my establishment, kept moderately cool even during the most oppressive summer weather, has operated both to attract new business and also, by assuring the comfort of patrons, to cause more food to be consumed than would have been desired in a less comfortable atmosphere."

Georgia Power Co., Kelvinator dealer, installed the air-conditioning system in the S. & S. Coffee Shoppe. The installation consisted of three suspended type air-conditioning units and a Kelvinator 15-hp. condensing unit. The condensing unit was installed in a shallow basement underneath the restaurant.

Temperature and humidity controls were installed in the restaurant for proper control of the temperature and humidity of the room.

Announcing the purchase of the manufacturing division of TRICO COMPRESSOR SERVICE Chicago, Illinois by PERFECTION

It is with pardonable pride that we announce that Perfection has purchased the manufacturing division of Trico Compressor Service, Chicago.

Through this acquisition Perfection has taken over the manufacture of Compressor Seals, Flapper Valve Plates, Seal Faces and other refrigeration compressor parts formerly made by Trico.

During recent months Perfection engineers have "worked wonders"—and jobbers and dealers alike should be vitally interested in the improvements and superior features characteristic of Perfection Certified Parts.

PERFECTION patented FLAPPER VALVE PLATES incorporate fewer parts and assure positive seat. The construction of the valve and retainer is such that the valve is self-seating. Design permits the disc to revolve and constantly seat itself. No lapping or fitting required, and quietness in operation is another of many features.

PERFECTION COMPRESSOR SEALS are self-contained. They are quiet, cause no seal squeak and are self-aligning. Noted for long life because of lower spring pressure and elimination of bellows.

PERFECTION SEAL FACES eliminate the necessity for relapping shaft shoulders, and in all cases do away with need of removing the shaft. These seal faces are available for 5/8" shafts, and can be used with any standard compressor seal. They are made of hardened steel, highly lapped, and are quickly and easily installed—using a Duprene gasket to prevent leakage.

It is no wonder that Perfection Certified Parts are so universally popular. Get complete information by requesting a copy of our new complete catalog—just off the press. It covers an unusually complete line of compressor parts for Frigidaire, Kelvinator, Copeland, Servel, Zerozone and others.

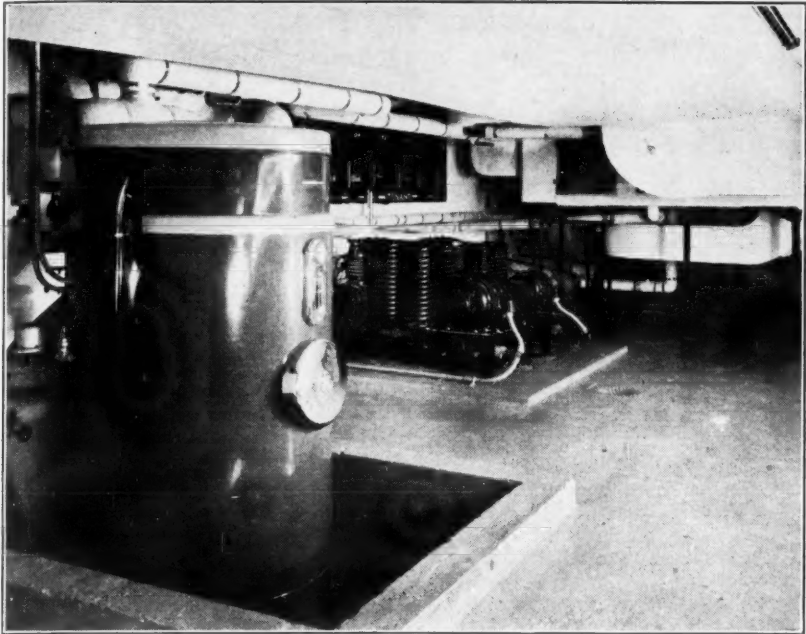
*Jobbers are invited to write
for details of attractive franchise*

PERFECTION REFRIGERATION PARTS CO.
(A division of the Perfection Gear Company, Established 1919)
HARVEY, ILLINOIS



**PERFECTION Certified Replacement Parts
for popular makes of refrigeration units**

Basement of Modern Apartment



The basement installation of air-conditioning equipment for the apartment house of Morris Sanders, architect, includes the G-E oil furnace in the foreground, compressors (center), and two separate conditioners at the right. Electrically operated automatic controls regulate the equipment.

Tampa Tribune Installs Year-'Round Air Conditioning in Entire Plant

TAMPA, Fla.—The complete year-'round system of air conditioning recently installed by the York Ice Machinery Corp. in the new building which houses the *Tampa Tribune* adds the final touch of scientific comfort to one of the most completely equipped and up-to-date newspaper plants in the country.

This air-conditioning system was installed after close consultation on the part of York engineers with Franklin O. Adams, architect who designed the building, and the architect's engineer, Albert H. Jones, in order to evolve a system of air conditioning which would meet the requirements of a modern newspaper plant, where activities in the several mechanical and business departments are practically continuous, although at different periods, through day and night.

Building Divided Into Six Zones

In order to provide for the circulation of a constant volume of fresh, conditioned air through the spacious, high-ceilinged interiors of the various offices and mechanical departments, it was found most practical to divide the two-story building into six air-conditioned zones, so arranged that each zone could function independent of any other. The system operates throughout the year.

By merely pressing a button on the wall, cool, clean, dehumidified air is supplied in summer, or warm air at any desired temperature and properly humidified for comfort, in winter.

All mechanical departments of the *Tribune*, except the photo-engraving department, are located on the first floor of the building.

Separate Unit for Each Zone

Six York year-'round air conditioners were installed to handle this arrangement of the building, one unit serving each of the six air-conditioned zones. These units are located centrally in the building, in such a manner as to conserve floor space.

No. 1 unit serves the press room, where the great presses turn out 36,000 completed newspapers in an hour, and the mailing room.

No. 2 unit air conditions the composing room, with its long battery of linotype machines, keeping the air in that room always cool and comfortable, despite the presence of electric furnaces supplying molten metal.

Likewise the atmosphere of the stereotype room, where lead plates are cast from type forms, is kept in a comfortable condition both summer and winter by unit No. 3. Unit No. 4 conditions the entrance lobby and first floor offices.

Flexibility Is Feature

Units 5 and 6, which are located in the attic of the building, serve the zones of the second floor, where are located the executive offices, editorial and news rooms, advertising department, photographic studio and dark room.

One of the outstanding features of this zoned system of air conditioning is its flexibility. Control of inside weather conditions in the various zones may be switched from summer to winter requirements in a few minutes.

In conjunction with the air-conditioning system, a special exhaust system has been installed to keep the etching and photographic departments free from noxious fumes, and to prevent these fumes from escaping into other departments. Another separate exhaust system also keeps the air fresh in toilets and rest rooms.

All attic air ducts of the system are thoroughly insulated to prevent condensation and reduce loss of energy to a minimum. The air ducts which convey air to the second floor zones are located in the attic space, while the ducts in the composing room and press room are painted white to harmonize with ceilings and to be inconspicuous.

Individual Control

Decorative ceiling plaques, harmonizing with the architectural and decorative treatment of the interior, permit conditioned air to be introduced to the second floor. This system of air distribution is so arranged that the air flow may be individually controlled by wall buttons in the various departments and private offices.

The basic mechanical element of this complete central plant, located in the engine room, consists of one 11x9-in. York Freon compressor, driven by a 75-hp. motor.

Condenser water for the system is drawn from a deep well, the pump drawing this water being also located in a pit in the engine room. Essential to the operation of the zone system are the six York horizontal-type air-conditioner units.

Architecturally, the new home of the *Tampa Tribune* is simple, the only decorative effect on the exterior being two vertical pilasters, one on each side of the main public entrance of the building.

Architectural Features

Each of the executive offices is paneled with matched Florida gumwood. Walls, ceilings, and floors throughout the entire plant have been insulated against noise, making each office or department completely sound proof.

The main entrance of the building is designed in black glass and white metal, and this motif is carried out in the main lobby and stairway leading to the offices on the second floor. This stairway is of white marble and black glass.

The lighting in the lobby is indirect and concealed, providing a soft flood illumination with entire absence of glare. The floor of the lobby is terrazzo of modernistic design, with radial lines which guide the patrons to the information and business counter at left of the lobby and to the stairway leading to news, editorial and advertising rooms above.

English Apartment House To Be Conditioned

LONDON, Eng.—Equipment for complete, year 'round air conditioning for Eaton House, an eight-story apartment building in this city, was ordered recently from J. B. Farish, manager of York-Shipley, Ltd., agents for the York Ice Machinery Corp., in England.

Novel feature of the installation is that each of the 28 apartments in the building will have a separate air-conditioning system of its own. Operating expenses will therefore be distributed so that each tenant will pay his own power and water bill.

Equipment for each apartment consists of a York 1½-hp. Freon condensing unit and a standard York horizontal type air conditioner. Automatic controls will regulate each system to supply complete summer and winter air conditioning. A separate system is being installed to cool the reception room, lobby, and offices on the main floor.

Drug Chemists Speed Sucret Manufacture By Air Conditioning

PHILADELPHIA—As an extension of its automatic refrigerating plant, installed four years ago, Sharpe & Dohme, chemists, this year added air conditioning in its sucret department, to aid in the manufacture of medicated throat tablets and candies. The tablets stick together when damp, and are consequently hard to pack.

P. Gormley Co. was consulting engineer on the project, and equipment and installation work was supervised by Mack Machine Co. of Pennsylvania, Frick distributor in this territory.

Although the sucret department is confined to one room, and a single air-conditioning unit handles the load, the system is of unusual interest because it illustrates both complete control and a method of applying low temperature brine to air conditioning work.

The room is 40 ft. wide, 60 ft. long, and 14 ft. high, and occupies a corner of the brick and concrete building. Load calculation was based on 95° F. dry bulb and 77° F. wet bulb temperature. Inside conditions required are 80° F. dry bulb temperature, with 40 per cent relative humidity.

Under normal conditions, the room is occupied by 50 people, in addition to whom there are 12 ½-hp. motors, for operating the automatic lozenge machines; a dozen 150-watt electric lamps; and no less than 1,200 lbs. of "candy" per hour is delivered to the room, at a temperature of 120° F.

Total load, including sensible heat and moisture from the fresh air introduced, is 141,616 B.t.u., consisting of 109,328 B.t.u. of sensible heat and 212,410 grains of moisture.

To handle this work, an air-conditioning unit of the blower type was

installed. Blower fans are belted to a motor on top of the unit. Just below the fans, inside the unit, is a heating coil; below this are the brine-cooling coils; and in the bottom are the cold water sprays, used for humidification.

Total amount of air handled is 5,000 c.f.m., of which 750 cu. ft. is outside fresh air. All the air is filtered through a renewable type filter, located inside the unit. Recirculated air returns through the open duct, on which several of the controls are mounted.

These include an insertion type thermostat and a membrane element insertion humidistat, the bulbs of both instruments extending into the return air stream. The thermostat controls a steam valve, which supplies the heating coil section of the air conditioner. The humidistat operates a reverse-acting diaphragm water valve in the cold water line to the spray heads, which are used only in winter.

The same instrument also serves as a pilot to a thermostat, the bulb of which is inserted in the brine discharge pipe from the cooling coil in the conditioner. This thermostat, in turn, controls a three-way valve, of 2-in. size, which permits part of the warmed brine to enter the feed line, along with the cold brine, at 15° F., supplied from the main refrigerating system.

Resulting mixture, at a temperature of 35° F., will not frost the cooling coils. A small pump keeps the brine moving through the loop. Wiring to the motor is tied in with that to the motor operating the fans.

Fan motor wiring is also connected to a solenoid air switch, part of the control system. The current in this line opens the switch, admitting air pressure for opening automatically a minimum fresh air damper, so that a certain amount of fresh air is always entering the system as long as the blower is running.

A relay operated also by air pressure is connected both to the main

fresh air damper and the humidistats. Atmospheric conditions in the room, as measured in the return air duct, govern the amount of fresh air admitted, the amount of air recirculated, the cooling applied at the brine coils, the steam to the heating coil, or the spray to the humidifier.

Actual working conditions in the department are said to be even better than anticipated. The 50 workers, most of whom are girls, enjoy year-'round comfort, and the controlled temperature and humidity conditions enable a better product to be turned out.

Omaha Restaurant Puts In Air Conditioners

OMAHA—A year-round air-conditioning system has been installed in Dixon's new restaurant and cocktail lounge here by Western Air Conditioning Corp. of Omaha. The equipment delivers from 6,000 to 8,000 c.f.m. to a room containing about 46,000 cu. ft. of space and seating about 175 people.

Occupying two levels, the restaurant is "L" shaped and requires an elaborate system of duct work. Discharge grilles, adjustable both for direction and air quantity, are furred in as a part of the architecture.

Brilliant lighting and the great crowds of people frequently make cooling necessary in winter. A large amount of fresh air is taken in and mixed with return air. The whole mixture is filtered before entering the conditioning unit.

Careful filtering of the air is important to preserve the Mexican murals which decorate the walls.

Baker Ice Machine Co., Inc., furnished refrigerating equipment of approximately 20 tons capacity; the conditioning unit is a Trane suspended high capacity type, with four-row cooling coils and single-row steam-tempering coil.

GAS CHARGING

means instant action at higher efficiencies



"Genuine Detroit"
No. 673. GAS or
LIQUID
CHARGED.



"Genuine Detroit"
No. 674.
GAS CHARGED.



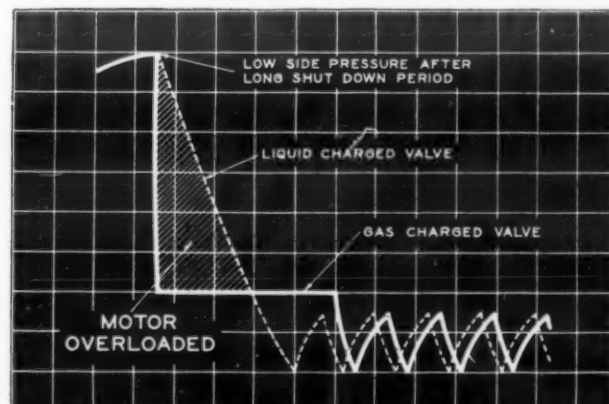
"Genuine Detroit"
No. 785.
GAS CHARGED.

WITH bullet-like swiftness the Thermostatic expansion Valve with Gas Charged power element, goes into action and keeps the system in balance from the start. Only "Genuine Detroit" Valves offer gas charging.

Motor overload is limited because suction pressure is definitely limited, regardless of temperature. A motor more efficient at full load and with better power factor, may be selected because the gas charged power element eliminates starting overload.

Response is instant because there is no temperature lag and no flood-over when the system is started. Sensitivity is also greater, assuring maximum coil efficiency at all times.

Let us send you the data for your own applications.



Comparing "Pull Down" performance with liquid and gas charged thermostatic expansion valves.



DETROIT LUBRICATOR COMPANY

DETROIT, MICHIGAN, U. S. A.

NEW YORK, N. Y.—40 West 40th St.

CHICAGO, ILL.—816 S. Michigan Ave. • LOS ANGELES, CALIF.—3251 Wilshire Blvd.

Canadian Representative—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

KEY SPECIFICATIONS FOR 6 MAKES—NEW 1936 MODELS

Stewart-Warner

Model	Shelf		No. of	Ice	Lbs.	—Exterior Dimensions—		
	Capacity	Area				Height	Depth	Width
	(Cu. Ft.)	(Sq. Ft.)	Trays	Cubes	of Ice			
Master Series								
456	4.5	10.2	2	56	4	51½	21	23½
556	5.5	13.3	4	96	8	54	23	28½
656	6.3	14.8	4	96	8	57½	23	28½
De Luxe Series								
566	5.5	13.3	4	93	8	54	23½	28½
666	6.3	14.8	4	93	8	57½	23½	28½
766	7.4	16.5	6	141	12	61½	24½	31½
866	8.1	17.7	6	141	12	64½	24½	31½

Models 666-P, 766-P, and 866-P are the same as 666, 766, and 866 models, except that exterior finish is porcelain. All other models have Dulux exteriors. Interior finish on all models is porcelain.

(Equipment in the Master Series includes Sav-A-Step (in 556 and 656 models), Tilt-A-Shelf, 11-point cold control, porcelain evaporator with reversible door, interior light, round wire shelving, chromium-finish hardware, snap-lock constructed door handle, and slo-cycle twin-cylinder compressor (model 456 has single-cylinder unit).)

Models in the De Luxe series have Sav-A-Step, Slid-A-Tray, Tilt-A-Shelf, illuminated 11-point cold control, safety zone temperature control, porcelain vegetable freshener, sliding fruit basket, no-tip diamond grid shelving, porcelain evaporator with reversible door, four-piece revolving Kontanerette, one rubber ice tray, removable shelf for double depth tray, automatic interior light, streamline chromium-finish hardware, pull-trigger door handle, and slo-cycle twin-cylinder compressor.

Fairbanks-Morse

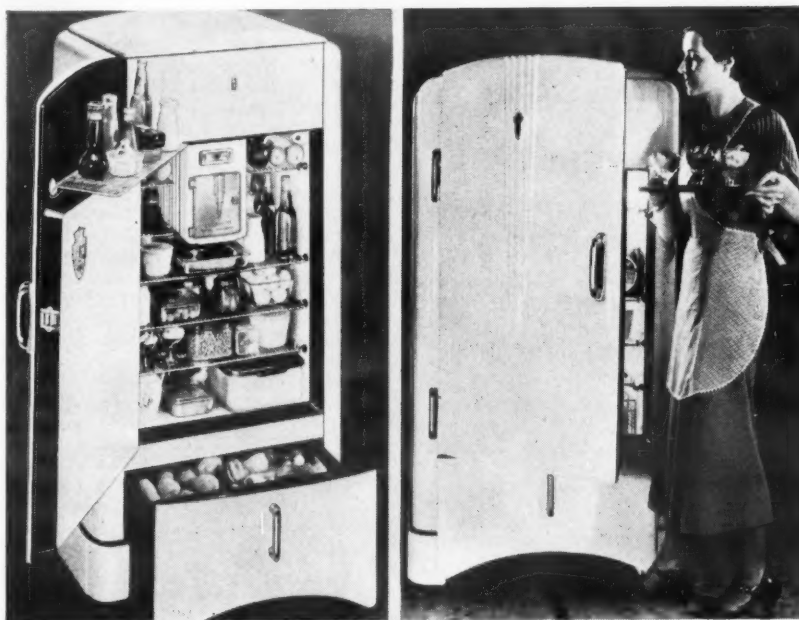
Model	Shelf		No. of	Ice	Lbs.	—Exterior Dimensions—		
	Capacity	Area				Height	Depth	Width
	(Cu. Ft.)	(Sq. Ft.)	Trays	Cubes	of Ice			
"C" Series								
C-4	4.2	9.25	2	42	5	51½	23½	24½
C-5	5.4	10.55	3	63	7½	56	24½	25½
C-6	6.3	12.55	3	63	7½	56½	24½	28½
C-6-Super	6.2	12.26	4	84	10	56½	24½	28½
"B" Series								
B-4	4.14	9.25	2	42	5	50½	21½	23½
B-5	5.11	10.55	3	63	7½	55½	22½	25½
B-6	6.01	12.55	3	63	7½	55½	23	28½
B-6-Super	6.01	12.26	4	84	10	55½	23	28½
B-8	8.01	15.76	4	84	10	58½	23½	34

All models have Conservador. "C" models, with exception of the C-4, have interior electric light. Larger models also have a four-piece Kontanerette set.

Exterior finish on all models is Dulux; interior finish is porcelain. Insulation, in

"C" models, is Balsam Wool; in "B" models, Thermocraft. "C" models also have a touch-open "Automatic Doorman," finned evaporator unit, and the Conservador basket is arranged to be more easily removed for cleaning.

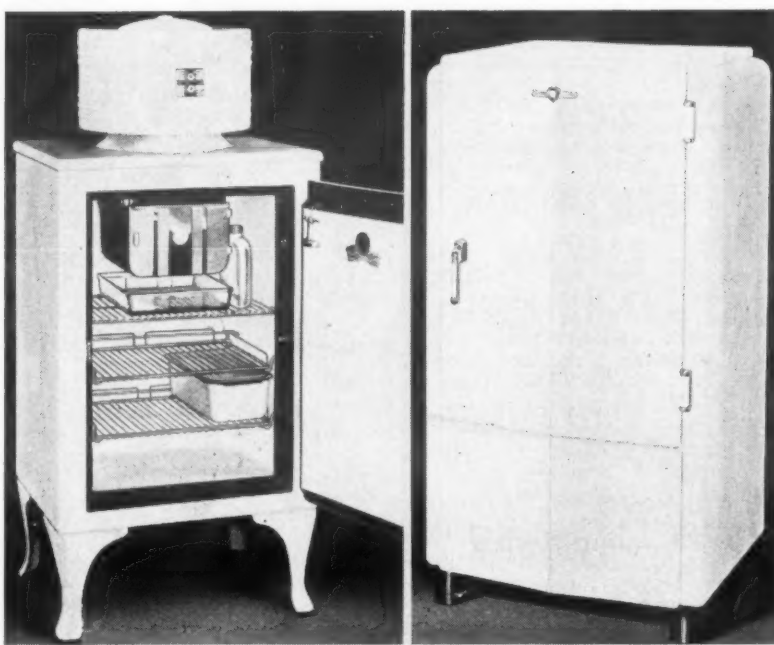
Leonard



Model	Storage Space		Ice	Lbs. of	—Exterior Dimensions—		
	Capacity	Shelf Area			Height	Depth	Width
	(Cu. Ft.)	(Sq. Ft.)	Cubes	Ice			
L3-36	3.16	8.12	32	4	45½	25½	24
L4-36	4.15	10.37	40	4.5	49½	25½	24
L5-36	5.15	13.16	72	10.5	55½	27½	29½
L6-36	6.18	13.45	72	10.5	57½	27½	32
L7-36	7.25	16.93	96	14	62½	27½	32
P5-36	5.15	13.16	72	10.5	55½	27½	29½
P6-36	6.18	13.45	72	10.5	57½	27½	32
P7-36	7.25	16.93	99	14	62½	27½	32
P10-36	10.59	21.88	108	20	64½	26½	40½
LS5-36	5.25	12.01	60	6.75	54½	27½	27½
LS6-36	6.17	13.17	72	10.5	57½	27½	29½

L model features include the Chillometer, rubber grids in each tray, temperature indicator, electric light, rear-ranging shelf, sliding shelf, vegetable crisper, utility basket. Models larger than L4-36 also have the Leonard, refrigerated shelf, and ice tray release. P models have all the features of the larger L models. LS models have the Chillometer, electric light, rubber grids in each tray and vegetable crisper.

General Electric



Model No.	Capacity		Shelf Area	No. of	Lbs. Per
	(Net Cu. Ft.)	(Sq. Ft.)			
				Cubes	Freezing
M-5	5.1	8.9	40	6	
M-6	6.4	11.8	84	8	
M-7	7.2	12.5	84	11	
TM-9	9.6	16.1	84	11	
SM-66	6.6	11.0	..	..
V-4	4.3	8.6	40	4	
V-5	5.2	10.2	40	6	
V-7	7.0	13.0	84	11	

Models M-5, M-6, M-7, and TM-9 have porcelain vegetable pan and automatic interior light. Models M-6, M-7, and M-9 have a water bottle. Models M-7 and M-9 have two sliding shelves, and model TM-9 has a set of glass dishes, and two drawers for fruits and vegetables.

Models V-4, V-5, and V-7 have the

rubber cube divider, vegetable pan, and ice tray remover. Models V-5 and V-7 have the foot pedal door opener and a water bottle, and model V-7 also has one all-rubber ice tray, set of glass food containers, one sliding shelf, and full-width vegetable drawer.

Many Refrigerators On Display at Home Furnishing Exhibits

CHICAGO—At least a dozen lines of 1936 electric refrigerators, manufactured by as many companies, and four lines of air-conditioning equipment were on display at the three national house furnishing exhibits running simultaneously here last week.

Displaying new lines of refrigerators were Apex, Crosley, Buckeye, Copeland, Gibson, Sparton, Norge, Sanitary, Stewart-Warner, Truscon, Westinghouse, and Zerozone. Air-conditioning equipment exhibits were shown by General Electric, Kelvinator, Norge, and Ilg.

Widest variety of refrigeration equipment was displayed at the ninth annual House Furnishing Exhibit at Hotel Stevens.

Here, Apex Rotarex Corp. displayed a complete line of Apex electrical appliances, including refrigerators, washers, ironers, and vacuum cleaners. In charge of the exhibit were C. W. Smith, D. M. Thomas, J. M. Michael, and R. J. Strittmatter.

Gibson Electric Refrigerator Corp. displayed a complete line of Gibson 1936 refrigerators, in three Standard models, of 4, 6, and 8 cu. ft. capacity, and two models of the Deluxe line of Freezer Shelf units, of 6 and 7 cu. ft. capacity. Advertising and sales promotion material was also available. In the exhibit were C. J. Gibson, L. E. Taufenbach, and S. E. Sweet.

Leonard Refrigerator Co. also had a room at the show, manned by J. J. O'Neil, B. T. Roe, and S. D. Camper. Norge Corp. displayed a full line of Norge electric refrigerators, washers, gas and electric ranges, oil burners, Aerolators, ironers, circulating space heaters, and fine air furnaces.

Sparks-Withington Co., in a display managed by A. T. Haugh, E. T. H. Hutchinson, Harley Wall, and Guy C. Core, showed the new Sparton refrigerators, radios, and metal and glass radio tubes.

Copeland, Truscon, and Zerozone shared an exhibit, in which were shown a complete line of refrigerators, featuring new combination sliding shelves and food files. L. E. Waggoner, manager of Truscon's household division, and H. L. Welsburgh, divisional sales manager, were in charge.

Universal Cooler Corp. displayed a new line of electric refrigerators, in three models of 4, 6, and 8 cu. ft. capacity, featuring modern styling and dual temperature cooler, with no visible frost accumulation. In the exhibit were H. E. Markland and R. G. Nelson.

Westinghouse Electric & Mfg. Co., in a four-room exhibit, showed everything from small heating appliances to a complete electric kitchen, featuring its "golden anniversary" electric refrigerators for 1936.

At the First International Housewares Show in the Merchandise Mart, Apex had a second display of its 1936 models; Crosley Radio Corp. showed several of its newest refrigerators, just put on the market; Gibson had a complete line in its exhibit; Edison General Electric Co. showed the new Hotpoint refrigerators, ranges, and water heaters; and Sanitary Electric Co. showed a sample of its 1936 line.

Norge had several models on the floor of the Hall of Science, Westinghouse showed an all-electric kitchen, with 1935 model refrigerator, and Frigidaire had a display designed to show the precision of Frigidaire manufacturing processes. Models used were last year's, however.

Air-conditioning equipment was displayed by General Electric, Kelvinator, and Ilg. Each company had several unit conditioners on the floor.

At the Furniture Mart, where the annual Winter Market was in progress, Gibson, Norge, and Stewart-Warner were the only refrigeration manufacturers displaying anything. Norge and Gibson displays duplicated their exhibits at the other two shows, while Stewart-Warner's complete 1936 line was on exhibit.

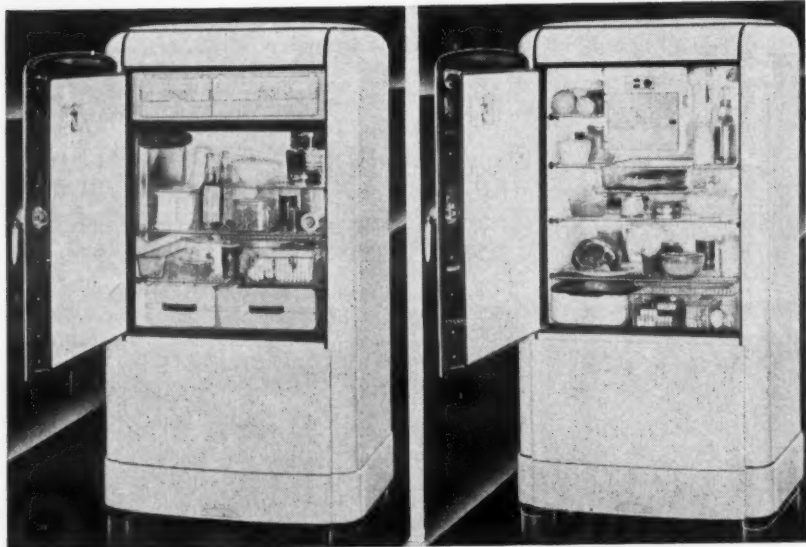
Instalment Selling Subject At Dry Goods Meeting

(Concluded from Page 1, Column 1)

"Home Building and Modernization." At this session Minnesota's former governor A. O. Eberhart, now a special representative of the Federal Housing Administration, and David E. Lillenthal, director of the Tennessee Valley Authority, are to speak on what their respective programs mean to the retailer. It is expected that there will be a discussion of the possible conflict of the FHA and TVA programs at this session.

The Thursday morning session of the credit management division on "Instalment Selling" is also expected to hold considerable interest for the electrical appliance merchandise men.

Kelvinator



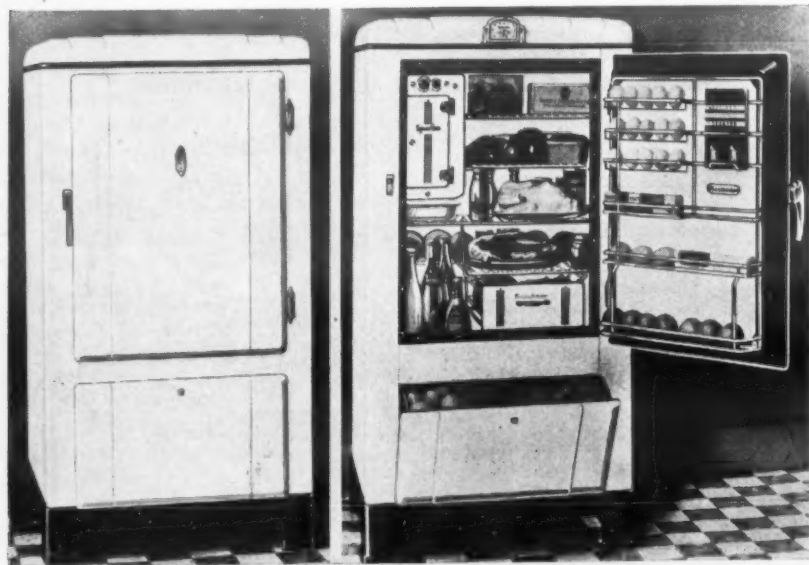
Model	Storage Space		Ice	Lbs. of Ice	—Exterior Dimensions—		
	Capacity	Shelf Area			Height	Depth	Width
	(Cu. Ft.)	(Sq. Ft.)	Cubes				
K7-36	7.18	14.81	120	13.5	61	26½	32½
K6-36	6.16	12.79	80	9.0	58½	26½	29½
K5-36	5.16	12.06	80	9.0	55½	26½	28½
K4-36	4.15	10.37	40	4.5	49½	25½	24
SD7-36	7.04	13.80	176	21.0	61½	28½	32½
SD9-36	9.20	18.51	187	23.5	66½	28½	34½
SD13-36	13.12	25.92	240	26.0	36½	28½	48
SD17-36	16.79	31.86	280	30.5	73½	28½	50½

Models PK7, PK6, and PK5 are the same as the K7, K6, and K5, with the exception that their exterior finish is in porcelain. Exterior finish of the K models is in Superlux. Interior finish is porcelain in all models.

K model features include built-in thermometer, all ice cube trays with rubber grids, vegetable crisper, utility basket, sliding shelf, sorting shelf, automatic electric light.

SD model features include built-in thermometer, separate freezing compartment, forced-draft circulation in food storage compartment, dry-cube trays, pastry set, below-freezing storage compartment, thrift drawer, vegetable crisper, sliding fruit basket, and food wheel.

Sparton



Model	Shelf		No. of	Ice	Lbs.	—Exterior Dimensions—		
	Capacity	Area				Height	Depth	Width
	(Cu. Ft.)	(Sq. Ft.)	Trays	Cubes	of Ice			
D-466	4.6	8.7	3	42	4.1	56½	22	24½
D-616	6.1	12	5	70	6.7	54½	24½	27½
D-746	7.4	14.5	5	70	6.7	54½	26½	29½
D-906	9	17.1	6	84	9.3	57½	28½	35½

Models S-466, S-616, and S-746 are the same as the corresponding model numbers in the D series, except that they have none of the Sparton convenience features. D models have Anti-Frost clock, Baskador, Baskadrawer, and Vegabin. Covered evaporator door and interior elec-

tric light are standard on all models except the S-466, which has neither. Exterior finish on all models is Sparlac enamel. Interior finish is porcelain. A four-piece Kontanerette set is furnished with all D models except D-466.

The Refrigeration Engineer's Manual

By S. L. Potts

Characteristics Which Govern The Choice of Refrigerants

Chapter 2—Refrigerants

Refrigerant. The refrigerant is the chemical that passes through the physical change of state, involving the transfer of large quantities of heat to produce that change of state.

The refrigerants that will be taken up here will be only those that can be used in the liquid vapor process, or the compression system.

Choice of refrigerant. There are many factors that must be considered in the selection of a refrigerant for use in any system. The relative values placed on some characteristic of a refrigerant might be rated entirely different by two engineers. The value placed on some characteristic by one engineer might not receive any attention from another.

Some refrigerants are not suitable for use in some types of plants, or in some locations, or for producing certain low temperatures, or for certain condensing temperatures. A wise selection of a refrigerant to use for any particular case in mind requires a thorough study and knowledge of all types of possible refrigerants.

Characteristics Governing Choice

Characteristics of refrigerant that will govern the selection for some particular system may be grouped under the following heads:

1. Condensing and boiling temperatures, and the related pressures.
2. Latent heat of vaporization and specific heat of the refrigerant.
3. Nature and the temperature of condensing medium that can be used.
4. Displacement volume of the compressor required to produce one ton of refrigeration, and the power cost per ton.
5. Effect of refrigerant on human life (Toxicity or poisonous action).
6. Degree of inflammability or explosiveness.
7. Fire hazard.
8. Odor.
9. Cost of the refrigerant.
10. Stability of the liquid or gas.
11. Effect on metals (corrosiveness).
12. Effect on lubricating oils.

Temperatures

Condensing and boiling temperatures and pressures. This characteristic of a refrigerant determines the first selection, and eliminates a large number of the possible liquids. The boiling point for the temperature required may be too high to produce

the low temperature desired, or it may require a very low pressure (high vacuum) to produce the low temperatures.

A high boiling point on the suction side requires a vacuum for operating at low temperatures. Likewise a very low boiling point usually requires a very high head pressure to produce condensation.

Low suction pressures always require large volume in the compressor, with increased cost of manufacture, and increased cost of power to operate. The head pressure may be limited by the tensile strength of the metals used, such as copper and brass pipe and fittings which must use low pressures.

Latent heat of vaporization and the specific heat of the liquid. The latent heat should be high for the change of state at the boiling point. The higher the latent heat, the less amount of the refrigerant required to be circulated per minute per ton of refrigeration.

Condensing Medium

Nature and temperature of the condensing medium. The mediums used most frequently are water and air. Any medium used must be cheap and plentiful in supply, and as low temperatures as possible. Using air for cooling requires that the refrigerant used must condense readily at temperatures of 80° to 110° F. without excessive head pressures. When water cooling is used, the temperatures run much lower as a rule, about 60 degrees to 85 degrees. These are temperatures taken during summer operation when the demands of the refrigerating plant are greatest.

Displacement volume of compressor which is required to give one ton of refrigeration. The size of the compressor needed might easily determine or bear considerable weight on the choice of the refrigerant to be used. Some refrigerants require large compressor capacity per ton of refrigeration, because the gases they compress are received at very low pressures. The density of the gas should be considered. It should be high. Some are much heavier than others. The refrigerant used should not require a pressure below atmospheric pressures to produce the refrigerating temperature. Such pressures in a vacuum cause leaks into the system as well as very large compressors.

Toxicity of Refrigerant

Toxicity. (Effect on human life). This factor alone determines the selection in many cases. Some refrigerants are restricted or prohibited for use in certain buildings, or in some systems of refrigeration. The poisonous results have been somewhat overdrawn to influence legislation against certain refrigerants, and to promote the use of others. Ammonia gets the greatest amount of adverse publicity. Compounds that contain chlorine and fluorine have received considerable criticism on account of the gases into which they break down when heated to high temperatures.

Inflammability and explosiveness. These factors do carry considerable weight in the selection of a refrigerant from the standpoint of the fire risk. Most all volatile gases are inflammable and some become highly explosive when broken down or subjected to presence of carbon compounds. The latter class should be avoided if possible.

The fire hazard refers back to the inflammability and explosiveness above.

The odor. The odor might be very desirable for finding leaks in the system, but if the odor has a bad effect on the individual, then it becomes a bad drawback. Some refrigerants are odorless and in these cases some material which carries a strong odor is introduced into the refrigerant to produce an odor to inform the operator of leaks when they do occur. The odor may be favorable and unfavorable at the same time.

Stability of Gas

The cost of refrigerant is seldom a determining factor in selection. The cost has a value in large plants where the cost of operating must be taken into consideration.

Stability of gas is very desirable, otherwise, a great loss from breakdown may result and often with other bad results possible.

Corrosiveness or action on metals. Some refrigerants have a very severe action on some metals. This alone would prohibit the use of the two together in any system of refrigeration.

Lubrication must be maintained in some parts such as compressors. The refrigerant used must not form destructive compounds with oil. Also the refrigerant must not destroy the lubricating qualities of the oil. The oil must not solidify or congeal at low temperatures. It is desirable to have a fairly high flash point.

Critical Pressure and Temperature

Critical pressure and temperature. The critical temperature of a refrigerant is the temperature above which it cannot be condensed into a liquid by increasing the pressure. It is the temperature at which the liquid flashes into a gas without the addition of latent heat, and the material exists only as a gas above that temperature. It is the highest temperature to which the liquid can be raised under any pressure and still remain liquid. The latent heat at the critical temperature is zero. The volume of the liquid and the gas at the critical temperature is equal. The density of the gas is equal to the density of the liquid at the critical temperature.

Synopsis of Preceding Instalments

THE REFRIGERATION ENGINEERS MANUAL, a guide for the licensed operator of industrial refrigeration systems, is presented to readers of the News as a course of study which will be of great value:

(1) To practical refrigerating engineers whose experience in ice making and cold storage plants has been entirely with ammonia systems,

(2) To installation and service men whose training has been limited to household and small commercial applications,

(3) To college trained engineers who understand the principles of refrigeration but who have had no direct contact with operating problems,

(4) To factory production men who are familiar with manufacturing processes but who have had no opportunity to learn the fundamental principles of refrigeration,

(5) To dealers and salesmen who have been successfully selling household units as package merchandise, and who see the need for a better understanding of the equipment in order to take advantage of the opportunities afforded by the development of air conditioning.

Chapter I, starting in the Jan. 1, 1936, issue and continued in the Jan. 8 issue, explains the physical laws involved in the process of producing artificial refrigeration and the principal types of systems used. This introductory chapter also defines the terms and units of measurements which will be used frequently in later discussions.

Chapter II, in this issue gives a comprehensive survey of the characteristics of all the various chemicals which may be used as refrigerants, with the advantages and disadvantages of those most commonly selected in commercial practice.

THE REFRIGERATION ENGINEERS MANUAL will be offered in book form about May 1, 1936. Approximately 300 pages. Price \$3.00 per copy. The MANUAL and a one-year subscription to the News is offered at the paid-in-advance combination rate of \$5.00.

Critical temperatures and pressures must both be above the working range for the temperatures carried in the system. The low critical temperature may cause troubles when condensation is considered. It may require the use of low temperature water and prohibit the use of air.

Leaks. It is generally accepted that outward leaks of refrigerants are better than inward leaks of air. This assumes that the refrigerant is non-toxic, non-irritating, non-inflammable, non-explosive, not injurious to foods or other products stored, and will not cause a panic or a fire hazard if a

large leak should occur. Refrigerants requiring pressures below atmospheric, make it next to impossible to find leaks on the low pressure side of a system.

General Requisites of Refrigerants

1. High latent heat to produce large refrigerating effect in the cycle of operation.
 2. A low boiling point at atmospheric pressure so as to be able to produce the low temperatures desired.
 3. A low condensing temperature at relatively low heat pressure.
 4. Low specific volume of vapor per ton of refrigeration.
 5. A high critical temperature.
 6. A low ratio of compression.
 7. No corrosive action on the metals used.
 8. A chemical compound that will be stable under all working conditions.
 9. No action on lubricants used.
 10. Non-inflammable and non-explosive.
 11. Inoffensive odor, non-poisonous, non-injurious.
 12. Easy to detect the presence of leaks in the system.
 13. Low cost of production as a commercial product.
 14. No affinity for air or water, so that no gases or acids will be formed affecting the operation.
- The various refrigerants most commonly used in refrigerating systems will be discussed, and their characteristics will be listed. Some have peculiar limitations that must be known and understood. Each refrigerant will be fully explained under its own heading.

Ammonia

Ammonia Characteristics

Chemical symbol is NH_3 . It is composed of one atom of nitrogen combined with three atoms of hydrogen to form one molecule of ammonia, (NH_3). This chemical is the most commonly used refrigerant, especially in plants of large capacity of refrigeration or in ice making.

In many localities, and in many types of work, the use of ammonia is prohibited or restricted very severely. For refrigerating work in hotels, auditoriums, schools, churches, theaters, and hospitals, the use of ammonia is restricted and in many places prohibited entirely.

Pressure and temperature. Ammonia at atmospheric pressure is always a gas at normal temperatures. It does not exist as a liquid at this pressure above a temperature of -28°F . Under a pressure of 62.29 lbs. absolute it will exist as a liquid at 32°F , at 107.6 lbs. pressure absolute it will exist as a liquid at 60°F . Under a pressure of 211.9 lbs. absolute it will exist as a liquid at 100°F .

Ammonia liquid is very volatile, that is, it evaporates very rapidly. As a gas, it is very penetrating and extremely irritating to the eyes and the nose. As a liquid, it can be contained in a vessel very readily, but as a gas, it will find the smallest leak hole possible. A very small amount of ammonia

(Continued on Page 22, Column 1)

Properties of Refrigerants

Table 1—Refrigerants: More Common

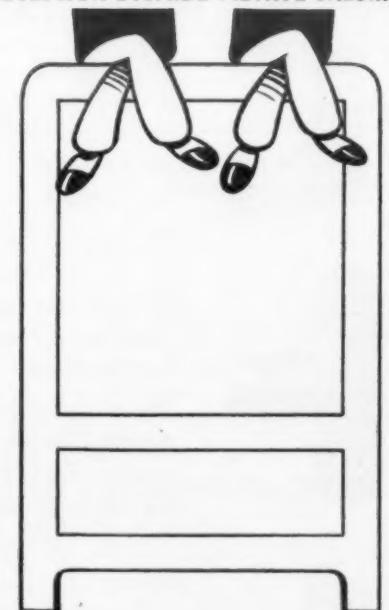
Refrigerant	Ammonia	Sulphur Dioxide	Carbon Dioxide	Methyl Chloride	Freon F-12	Isobutane	Ethyl Chloride
Chemical symbol	NH_3	SO_2	CO_2	CH_2Cl	CCl_2F_2	$(\text{CH}_3)_3\text{CH}$	$\text{C}_2\text{H}_5\text{Cl}$
Molecular weight	17.032	64.06	44.0	50.481	120.9	58.12	64.5
Boiling temperature, atmospheric pressure	-28.0	$+14.0$	-108.4	-10.0	-21.7	$+10.6$	$+53.96$
Melting point, degrees	-107.86	-98.86	-160.6	-143.68	-247.0	-229.0	-217.7
Suction pressure gauge for 5°F .	19.57	11.8	319.7	6.19	11.51	13.1	4.65
Condenser pressure gauge for 86°F .	154.5	51.75	1024.3	80.83	93.2	44.8	12.4
Volume gas 5°F , cu. ft. per lb.	8.150	6.421	.2673	4.530	1.485	6.41	17.06
Volume gas 86°F , cu. ft. per lb.	1.772	1.185	.0474	1.075	.389	abso.	abso.
Density satur. gas, lbs. per cu. ft., 5°F .	.1227	.1558	3.741	.2209	.6735	.156	.0586
Density liquid 5°F , lbs. per cu. ft.	41.11	92.0	61.2	61.0	90.2	37.4	59.16
Heat contents gas leaving evaporator 5°F .	613.35	183.49	102.14	199.76	78.79	162.0	165.4
Heat contents liq. leaving condenser 86°F .	138.9	42.12	45.45	59.34	27.72	50.50	23.1
B.t.u. refig. effect per lb. per standard ton	474.45	141.37	56.69	140.42	51.07	111.5	142.3
Refrig. circul. min. lbs. per standard ton	.4215	1.414	3.528	1.424	3.916	1.794	1.405
Refrig. effect B.t.u. per cu. ft. of cyl. displ.	58.3	22.0	212.0	31.0	34.4	17.4	8.35
Critical temperature degrees F.	271.2	314.8	87.80	289.6	233.0	272.7	361.0
Critical pressure gauge	1651.0	1141.5	1071.0	969.0	580.0	522.3	784.0
Specific heat gas at constant pressure	.52	.1544	.2012	.24	.....	.....	.274
Specific heat liquid at 32°F .	1.099	.41	.79	.465	.....	.....	.427

Table 2—Refrigerants: Less Common

Refrigerant	Butane	Ethane	Ether	Methane	Nitrous Oxide	Propane	Water
Chemical symbol	C_4H_{10}	C_2H_6	$\text{C}_2\text{H}_5\text{O}$	CH_4	N_2O	C_3H_8	H_2O
Molecular weight	58.10	30.06	74.1	16.04	44.08	44.09	.....
Boiling temperature at atmospheric pressure	$+31.0$	-135.0	$+94.1$	-265.0	-129.8	-49.0	$+212.0$
Melting point, degrees	-211.0	-276.0	-179.0	-229.0	-152.0	-317.0	$+32.0$
Suction pressure absolute for 5°F}.	.....	.....	.....	.....	.....	.....	.....
Condenser pressure absolute for 86°F}.	.....	.....	.....	.....	.....	.....	.....
Lbs. gas per cu. ft. 14.7 lb. pressure 32°F .	.1619	.0846	.048	.0447	.1234	.1280	.....
Density gas 32°F , 14.7 lbs. pres. air = 1.	2.006	1.0489	2.58	.5544	1.5269	1.5620	.....
Density liquid 32°F , to water = 1.	.60	.446	.72	.415	1.2257	.536	.....
Volume gas 86°F , cu. ft. per lb.	.....	.....	.....	.....	.....	.....	.....
B.t.u. content 5°F gas leaving evaporator	.....	.....	.....	.....	.....	.....	.....
B.t.u. content 86°F liquid leaving condenser	.....	.....	.....	.....	.....	.....	.....
B.t.u. refig. effect per lb. per standard ton	.....	.....	.....	.....	.....	.....	.....
Refrig. circulation minute lbs. per std. ton	.....	.....	.....	.....	.....	.....	.....
B.t.u. refig. effect cu. ft. cylinder displ.	.....	.....	.....	.....	.....	.....	.....
Critical temperature, degrees F.	95.7	-115.6	.....	.....	216.0	90.0	706.1
Critical pressure, lbs. absolute	544.0	720.0	523.0	907.0	108.2	647.0	3226.0
Specific heat of gas at constant pressure	.351	.397	.428	.5929	.2209	.365	.....
Specific heat of liquid at 32°F}.	.....	.....	.51	.529	.....	.....	1.0

The ANSUL
Twins
MAKE
REFRIGERATION
SATISFACTION
Certain

SULPHUR DIOXIDE METHYL CHLORIDE



You will find Ansul Sulphur Dioxide and Ansul Methyl Chloride perfect for refrigeration purposes. The individual analysis of every cylinder is your guarantee of highest quality at all times.

ANSUL CHEMICAL COMPANY
MARINETTE WISCONSIN

Analysis of Commonly Used Refrigerants; Desirable Characteristics of Each

(Continued from Page 21, Column 5)
monia gas creates a very strong odor over a large area.

Solubility of Ammonia

Solubility. Ammonia as a gas is very soluble in water. A quantity of water at 60° F. will absorb about 900 times its volume of ammonia gas. When the gas is absorbed by the water it becomes harmless to the individual.

Critical temperature is 271° F. Pressure 1651. The temperature of the gas should never exceed 300° F. It breaks down at temperatures above this.

Anhydrous ammonia means ammonia that is free from all water. This is the condition in which it should be used in all compression systems.

Impurities in NH₃. Many times it can contain impurities which reduce its effectiveness as a refrigerant. To test for impurities, pour some of the liquid into a test tube and allow it to evaporate. Usually the impurities will be left in the tube.

Inflammability. At ordinary temperatures, ammonia does not burn readily when lighted. When heated with a flame, it will burn with a greenish-yellow color. When heated to 1,800° F. it will break down into its constituent parts, nitrogen and hydrogen. Under some conditions, such as when mixed with oil that contains a large percentage of carbon, these gases form an explosive mixture. A hot flame will decompose ammonia and ignite the resulting gases.

Effects on metals. NH₃ either as a gas or as a liquid, is active on all metals like copper, brass, tin, etc. When moisture is present, the action on these metals increases. Ammonia has no effect on iron and steel under any conditions found in refrigerating plants.

Leaks. A very small leak is very noticeable, but very hard to find. The smell indicates the fact of the leak. A sulphur candle burned in the presence of ammonia fumes, forms dense grey smoke. The leak may be large enough to make a hissing sound as of escaping gas. Soap bubbles may be the only way to find the exact location of a leak if it is very small.

Lubrication. Anhydrous ammonia has very little or no effect on petroleum oils, but in the presence of moisture from the ammonia or from the oil, and at compressor temperatures, an emulsion will be formed.

Desirable characteristics that make ammonia the most favored refrigerant in commercial plants are:

1. Its high latent heat of evaporation.
2. Its very easily obtained evaporating pressures.
3. Its very easily obtained condensing pressures.
4. Its low condensing temperature.
5. Its tell-tale odor.
6. Its relative low cost.

Undesirable characteristics that restrict or prohibit its use in some places are:

1. Its tell-tale odor.

2. Its high toxicity (poisonous effect to humans).

Sulphur Dioxide

The chemical symbol is SO₂. It is composed of one atom of sulphur and two atoms of oxygen to form one molecule of sulphur dioxide. It is produced by burning sulphur in air. This chemical is very popular in household refrigerating plants (small units only). Sulphur dioxide has not been criticised and its use prohibited to the same extent as ammonia.

Sulphur Dioxide Characteristics

Sulphur dioxide is highly volatile (evaporates rapidly). As a gas, it is very pungent and very unpleasant to breathe. It is very penetrating, an irritant to the eyes, nose, and throat, and may cause suffocation if breathed long. The gas is very heavy, colorless, very stable, and will withstand any temperatures met with in refrigeration.

It is readily contained in a vessel in the liquid or gaseous form, because the operating temperatures are very low. The gas is 2.26 times as heavy as air. Liquid is thin, odorless with specific gravity of 1.49.

Pressures and temperatures. Sulphur dioxide at atmospheric pressure is always a gas at normal temperatures. It does not exist as a liquid at this pressure above a temperature of 14° F. Under a pressure of 7.74 lbs. gauge (22.44 absolute), it will exist as a liquid at 32° F. At 25.83 lbs. gauge pressure (40.53 absolute) it will exist as a liquid at 60° F. Under a pressure of 70 lbs. gauge (84.75 lbs. absolute), it will exist as a liquid at 100° F. This gives it a very high evaporating temperature and a low condensing temperature at pressures very easy to produce. This makes it very desirable for household use, because high temperature condensing mediums can be used without raising the condensing pressures too high.

Solubility. Sulphur dioxide will combine with water very readily to form sulphurous acid. This is always bad.

Critical temperatures and pressures of sulphur dioxide are 314.8° F. and 1141.5 lbs. pressure.

Anhydrous sulphur dioxide should always be used in refrigeration. A very small amount of moisture introduced into the system will soon cause pitting and corrosion that will interfere with the correct operation of the plant.

Impurities. The gas or liquid should be free from all impurities.

Inflammability. Sulphur dioxide is not inflammable because it is the product of combustion of sulphur. It is not explosive in any way.

Effects on metals used. Pure sulphur dioxide has no effect on any of the common metals used in refrigeration. Sulphur dioxide with a small amount of moisture forms sulphurous acid which does become very active on all metals. Care must be taken to keep it pure.

Leaks. These will always be indicated by the smell. Small leaks are hard to find. Ammonia water brought close to the leak will produce a dense

Table 3—Physiological Effects Produced by Refrigerants in Gaseous Form

Refrigerant	Chemical Symbol	Boiling Temperature Deg. F. at 14.7	Ignition Temperature Degrees F.	Per Cent by Volume Kills Animals in Short Time	Per Cent by Volume Dangerous To Animals in 30-60 Minutes	Per Cent by Volume Without Serious Results in 60 Minutes	Per Cent by Volume for Prolonged Exposure, Several Hours Without Trouble
Ammonia	NH ₃	-28	1204	5-1	.25-.45	.03	.01
Sulphur Dioxide	SO ₂	+14	No Inf.	2.0	.04-.05	.005-.02	.01
Carbon Dioxide	CO ₂	-108.4	No Inf.	29-30	6-8	.4-6	.05-.10
Methyl Chloride	CH ₃ Cl	-10	1170	No Dang.	No Dang.	.7	
Dichlorodifluoromethane (Freon) (F-12)	CCl ₂ F ₂	-21.7	No Inf.	No Dang.	No Dang.		
Isobutane	(CH ₃) ₂ CH	+10.6					
Ethyl Chloride	C ₂ H ₅ Cl	+53.96	966		6 to 10	4	2
Butane	C ₄ H ₁₀	+33	806		4.7-8.8	1.7-2.6	
Ethane	C ₂ H ₆	-135	950				
Ether	(C ₂ H ₅) ₂ O	+94.1					
Methane	CH ₄	-265			.01	.007	.0033
Nitrous Oxide	N ₂ O	-129.8	No Inf.				
Propane	C ₃ H ₈	-42	871				
Water	H ₂ O	+212	No Inf.				
Carbon Bisulphate	CS ₂	+170	No Inf.	.5-1	.001	.0002	.0001
Carbon Monoxide	CO	+170	No Inf.	4.8-6.3	.2-3	.05-.10	.04
Carbon Tetrachloride	CCl ₄	+140	No Inf.	6.8-8.2	2.4-3.2	.4-6	.16
Trichloromethane (Chloroform)	CHCl ₃	+122	825	.1	.004-.006	.0004	.0001
Chlorine	Cl ₂	+122	825	No Dang.			
Dichloroethylene (Diene)	C ₂ H ₂ Cl ₂	+39	No Inf.	No Dang.			
Dichlorotetrafluoromethane	C ₂ Cl ₂ F ₄	+100	950		1-2	.6	.17-.30
Ethyl Alcohol	C ₂ H ₅ OH	+170	No Inf.				
Ethyl Bromide	C ₂ H ₅ Br	+100	950				
Gasoline		85-200	Varies	.5	1.1-2.2	.43-.71	.005
Hydrogen Chloride	HCl	-85	Varies	.06-.1	.15-.2	.005-.01	.01-.02
Hydrogen Sulphate	H ₂ SO ₄	+270	No Inf.		.05-.07	.02-.03	.005-.017
Methyl Bromide	CH ₃ Br	+40	950		.2-.4	.1	
Methyl Alcohol	CH ₃ OH	+89	850				
Methyl Formate	CH ₃ OOCH ₃	+104	1224				
Methylene Chloride (Carrene)	CH ₂ Cl ₂	+11	No Inf.	.02-.05	.0025		.0001
Monofluorotrichloromethane	CCl ₃ F	+11	No Inf.				
Phosgene	COCl ₂	+187	No Inf.				
Trichloroethylene (Trielene)	C ₂ HCl ₃	+187	No Inf.				

grey smoke. Soap bubbles are used to locate the exact leak if small.

Lubrication. Sulphur dioxide does have some effect on some kinds of petroleum oils by absorbing the oil. Light oils are more readily absorbed than dark oils. The oil should be totally free from all moisture.

Compressor capacity. Sulphur dioxide requires about three times the compressor capacity that is required for ammonia for the same refrigerating effect.

Desirable characteristics that make sulphur dioxide good for domestic refrigeration.

1. Very low head pressure.
2. Evaporating temperatures low enough for domestic refrigeration.
3. No effect on copper and brass.
4. Air can be used for the condensing medium even in summer time without producing excessive head pressures.
5. Very low cost chemical.

6. There are no restrictions or prohibitions, yet it is highly toxic in action on life.

Undesirable characteristics are:

1. It is highly toxic.
2. Requires large compressor volume for low temperatures.
3. Its odor.

Carbon Dioxide

The chemical symbol is CO₂. It is composed of one atom of carbon and two atoms of oxygen to form one molecule of CO₂. It is produced by burning carbon in air. This refrigerant has gained popularity due to the restrictions that have been placed on ammonia.

It is favored for large capacity in places where ammonia cannot be used. Small quantities of carbon dioxide are used in many drinks such as ginger ale, beer, and many others, and is beneficial to the human system.

Carbon Dioxide Characteristics

Characteristics. Carbon dioxide as a liquid is very volatile. As a gas it is very heavy, colorless, and odorless. Small amounts of carbon dioxide are free in the air. All plant life requires carbon dioxide for its growth. Carbon dioxide is harmless to breathe except in extremely large doses, and then it is only harmful in as much as it excludes air from the lungs in the form that is available for human existence.

If breathed to the exclusion of air, it will cause suffocation. It is a very stable gas and will withstand any temperatures found in refrigeration. It is not combustible because it is produced by combustion. It is non-irritant, and non-toxic.

A mixture of 2 per cent to 10 per cent CO₂ may be breathed for a long time without producing any worse effect than sleepiness and headache, and reduced operating efficiency. Specific gravity of gas is 1.529 to air at 1. Specific gravity of liquid at 32° is .93 to water at 1, and decreases for higher temperatures.

Solubility in water is very small. It has no significance.

Critical temperature and pressure. The temperature is very low, about 88° F. and at a pressure of 1071 lbs. This is too low for good condensing temperatures. The coldest water obtainable must be used to get good results. Air cannot be used.

Compressor capacity. Carbon dioxide requires about 3/4 to 1 1/2 the compressor capacity that is required for ammonia for the same refrigerating effect. This small compressor capacity is partly accounted for in the very high suction pressures used for the average temperatures used.

Anhydrous. Moisture has no bad effect with carbon dioxide.

Impurities. There are none that cause serious trouble.

Inflammability. CO₂ is non-inflammable and non-explosive because it is the product of combustion. Carbon

dioxide in compounds is used for some kinds of fire extinguishers, and its action is to smother the fire.

Effects on metals. It is non-corrosive on any of the metals used for refrigeration.

Leaks are very hard to detect and find. Due to the fact that it is odorless, leaks may occur and no notice is given to the operator until his charge is lowered or completely gone. Oil of peppermint is mixed in the liquid CO₂ to give it an odor that can be detected when a leak occurs. Soap bubbles are used to locate small leaks. Sulphur candles or ammonia water have no effect on CO₂.

Lubrication. CO₂ has no effect on oils or greases. The oil must have a low temperature test. Glycerine is preferred in some plants for lubrication, because it will stand low temperatures and is not affected by acids.

Desirable characteristics, that make CO₂ good for refrigeration, are:

1. Non-toxic.
 2. Small compressor sizes.
 3. Extremely low refrigerating temperatures.
 4. Non-corrosive.
 5. The chemical is cheap.
- Undesirable characteristics** are:
1. Extremely high head and suction pressure.
 2. Materials used must be of high tensile strength.
 3. Its very low critical temperature.
 4. Requires cold water for its efficient condensing.
 5. Low latent heat of evaporation.

Methyl Chloride

The chemical symbol is CH₃Cl. It is composed of one atom of carbon, three atoms of hydrogen, and one atom of chlorine, to form one molecule of methyl chloride. It is produced readily from methyl alcohol and hydrochloric acid. This chemical is used extensively in household refrigeration in this country, and for some commercial plants in Europe.

Methyl Chloride Characteristics

Characteristics. This chemical vapor is mildly toxic, nearly colorless, nearly odorless, and has only a faintly sweetish taste or smell. No satisfactory odorant has been found to mix with the liquid to make the odor pronounced. The liquid is colorless.

Pressure and temperatures. At atmospheric pressure it evaporates at

10° below zero and does not exist as a liquid at atmospheric pressure and at normal temperatures. At 95.5 lbs. absolute pressure, it will exist as a liquid at 86° F. These temperatures and pressures make this refrigerant satisfactory for all types of refrigeration, and all kinds of condensing mediums. For all usual temperatures required for refrigeration, the pressures are above atmospheric thus avoiding operating in the vacuum or pressures less than atmospheric.

Solubility. Water at 60° F. will absorb three to four times its volume of methyl chloride gas at atmospheric pressure.

Critical temperature and pressure. The critical temperature is 289.6° F. and the pressure is 969 lbs. Both of these are very satisfactory for refrigeration work.

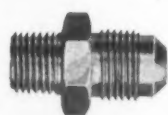
Inflammability. It is inflammable to a slight degree at high temperature. A mixture of about 10 per cent methyl chloride with air is explosive with a spark or a white hot wire.

Effects on metals. It has no effect on iron, steel, copper, or brass.

Leaks are hard to find because the gas is nearly odorless and the pressure on the system is low. The approximate location of the leak can be found with an alcohol lamp. The flame of this lamp burns green when brought close to a methyl chloride leak. Care must be taken to see that the amount of gas does not approach the explosive mixture.

Methyl chloride acrolein, abbreviated "Methyl Chloride A," is Methyl Chloride with 1 per cent acrolein used (Concluded on Page 23, Column 1)

VIRGINIA SMELTING CO.
WEST NORFOLK VIRGINIA
EXTRA DRY
ESOTOOL
LIQUID SULPHUR DIOXIDE
V-METH-L
VIRGINIA METHYL CHLORIDE
131 State St. Boston — 76 Beaver St. New York



WE PAY A BONUS (In Service)

We are not talking about the Soldiers Bonus altho that is quite a topic of conversation at this time. We refer to the bonus of hours, days, months and years of additional use of refrigeration equipment made possible by the employment of

Commonwealth Brass Fittings "Built Right To Stay Tight"

These fittings while costing the user no more than the ordinary article, deliver such a bonus in the way of additional, trouble-free service that we would be justified in charging and collecting a premium for our merchandise.

The bonus values arise in connection with perfect threads and seats; 100% inspection, protection in shipping, correct design and metallurgy as well as the experience of an organization of specialists in refrigeration fittings.

We have hundreds of patterns of standard and semi-standard fittings; always maintain adequate stocks for prompt shipments and are daily manufacturing special fittings for those whose processes demand departures from conventional design.

Quotations promptly

Commonwealth Brass Corporation
Commonwealth at G. T. R. R.
Detroit, Mich.

We Say It.. WE MEAN IT

NO HIGHER than \$2.- \$2.50 - \$3.

FOR A SINGLE ROOM WITH BATH IN DETROIT

800 ROOMS

CLIFFORD R. TAYLOR
Managing Director

Hotel TULLER
FACING GRAND CIRCUS PARK

Come in any time—at any hour—you can't pay more than \$3 for a single room with bath and plenty are offered at \$2. and \$2.50 Good food every comfort,— every luxury.

Characteristics of Refrigerants

(Concluded from Page 22, Column 5)
as a warning agent. Acrolein is a very strong irritant on eyes, throat, and nose, very highly toxic, and its presence in very small amounts is easily recognized. It cannot be used in the presence of sulphur dioxide.

Lubrication—any good mineral oil. Compressor capacity will have to be about twice the capacity of ammonia for the same refrigerating effect.

Desirable characteristics.

1. The evaporating pressures are easily obtained.
2. The condensing pressures are low.
3. Permits air to be used as the condensing medium.
4. Has no bad effects on metals most frequently used.
5. Only slightly toxic, only moderately inflammable.
6. Moisture produces no serious action.

Undesirable characteristics.

1. Leaks are hard to find.
2. Somewhat toxic, somewhat explosive.
3. Requires somewhat larger compressor capacity than NH_3 .

Freon (F-12)

Freon or Dichlorodifluoromethane or F-12

Chemical symbol is CCl_2F_2 . It is composed of one atom of carbon, two atoms of chlorine, and two atoms of fluorine, to make one molecule of dichlorodifluoromethane. This chemical is very popular for domestic refrigeration and for air conditioning.

Characteristics. The liquid is clear white, boils at -21.5°F . at atmospheric pressure. The gas is colorless, heavier than air, the specific gravity compared to air is 4.26. The odor is similar to chloroform. The gas starts to break down into its constituent parts at $1,050^\circ\text{F}$. and the breakdown is complete at $1,400^\circ\text{F}$.

The breakdown starts at lower temperatures when in the presence of some metals, such as copper at 780° , lead 620° , tin 450° , solder 400° . The boiling point at atmospheric pressure is -21.5°F . and the melting point is -247°F . The density of the liquid is 1.445 at 5°F . compared to water at 1.

Pressure and temperature. Freon at atmospheric pressure is always a gas at normal temperatures. It does not exist as a liquid at atmospheric pressure above a temperature of -21.5°F . At 28.5 lbs. gauge pressure, it will exist as a liquid at 30°F . At 70 lbs. gauge pressure, it will exist as a liquid at 70°F . At 117 lbs. gauge pressure, it will exist as a liquid at 100°F .

Critical temperature and pressure. The critical temperature is 233°F . and the pressure is 580 lbs. absolute.

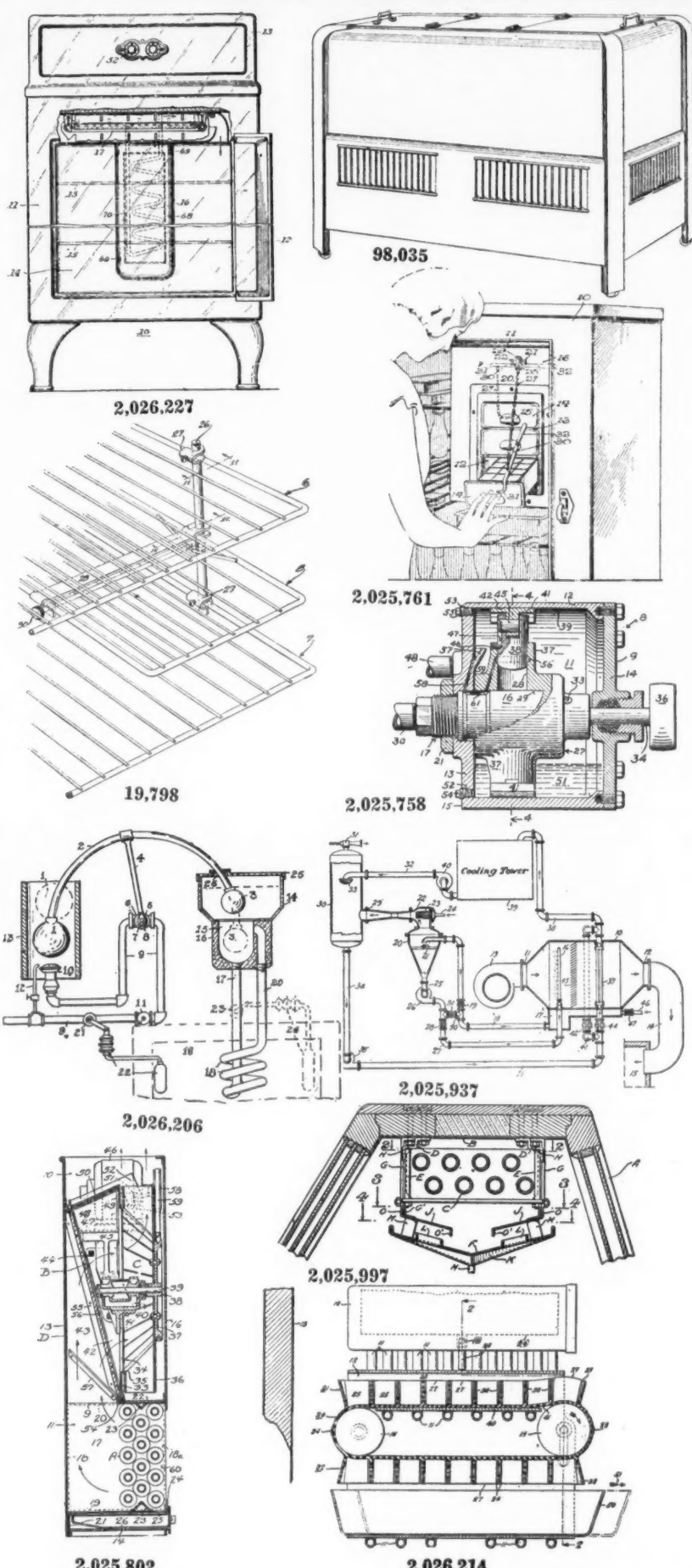
Solubility in water at room temperatures is very small.

Inflammability. It is non-inflammable and non-combustible.

Effects on metals. It has no corrosive action on iron, steel, copper, brass, aluminum, babbitt, lead or solder.

Leaks are hard to find. The slight odor of chloroform will help.

Lubrication. Freon is completely



miscible in lubricating oils. Owing to the fact that Freon and mineral oils are miscible, a higher oil viscosity is required than when using a refrigerant that does not mix. For domestic service with flooded systems, use 150 viscosity. With expansion systems, use 300 viscosity. The flash point should be 350 to 425°F . The fire point 390 to 475°F . and pour point of -30 to -10°F .

For large air-conditioning compressors of the enclosed type, use an oil up to 900 viscosity. The flash point up to 475°F . Fire point up to 575°F . and pour point from 0 to 15°F . The type of compressor determines the viscosity of the oil to be used. The type of evaporator determines the pour point.

The flash point should be high to eliminate any possibility of carbonization of oil. The oil should be a good grade of mineral oil, free from water, sediment, acid, soap, resin, and must not form water or gum at low temperatures. Oil must not be corrosive on any of the metals used.

Compressor capacity. The volume displacement of a Freon compressor will be about twice the displacement of an ammonia compressor of the same refrigerating capacity.

The values given in tables 1, 2, and 3 are the values that represent the conditions that an operating engineer would need to know with reference to a large number of refrigerants. The list is not complete as there are many compounds that might be used for refrigerants, but a large number of them have some characteristic that prohibits their use as such. They may be highly explosive when compressed, highly poisonous, high cost to purchase, low heat values, etc.

The values given here have been gathered from many sources and for this reason the values differ considerably. In other cases such as gas densities and volumes, the different authorities give different pressures and temperatures, so that it makes it difficult to have all the values check.

The values given are from the best authorities at hand, and in some cases have been changed to suit the conditions under which they are listed. For some of the less known refrigerants, very little information has been published.

The values given are from the best authorities at hand, and in some cases have been changed to suit the conditions under which they are listed. For some of the less known refrigerants, very little information has been published.

Reference Books

A list of the references from which the information given here has been gathered follows so that any one interested can hunt the information from the original sources and judge the values for himself. Many values have been changed quite recently and no doubt, many other changes will follow, as further experiments and tests are made.

Reference has been made to the following:

Kents Mechanical Engineer's Pocket Book.

Moyer and Fitts Refrigeration.

American Society Refrigerating Engineers Handbook.

Bureau of Standards Technical Papers on Refrigerants.

Kinetic Chemical Co. Reports on Safe Refrigerants.

H. B. Hull on Household Refrigeration.

Roessler and Hasslacher Chemical Co. Reports on Refrigerants.

American Chemical Society reports on refrigerants.

(To Be Continued Next Week)

DISTRIBUTORS WANTED

NEW 1936 LINE

Artificial Food Products For Refrigerator Display. Permanent, Natural, Durable.

Most complete line on the market. 50 pieces for selection.

Kits packed to your requirements. Write for our attractive proposition.

ROMAN ART CO., INC.
2700 Locust St., St. Louis, Mo.

Patents

Issued Dec. 31, 1935

2,025,758. COMPRESSOR. Richard H. Long, Alameda, Calif. Application July 5, 1932, Serial No. 620,871. 2 Claims. (Cl. 230-177.)

2,025,761. REFRIGERATOR. Joseph H. McCann, Washington, D. C., assignor to General Motors Corp. Application May 14, 1932, Serial No. 611,395. 16 Claims. (Cl. 62-108.5.)

2,025,802. AIR CONDITIONER. Lachlan W. Child, Toledo, Ohio, assignor to Aeriet Air Conditioner Co. Application Aug. 25, 1934, Serial No. 741,453. 15 Claims. (Cl. 257-137.)

2,025,937. AIR CONDITIONING. Dion Kanouse Dean, Rahway, N. J., assignor to Foster Wheeler Corp., New York, N. Y. Application Oct. 29, 1931, Serial No. 571,872. 19 Claims. (Cl. 257-8.)

2,025,997. REFRIGERATOR DRIP PAN. William Benton McMillan, St. Louis, Mo., assignor to Hussmann-Ligonier Co., St. Louis, Mo. Application Feb. 10, 1934, Serial No. 710,630. 9 Claims. (Cl. 62-103.)

2,026,206. PROCESS AND APPARATUS FOR REFRIGERATION. James C. Armour, Bellevue, Pa. Application Sept. 28, 1932, Serial No. 635,147. 14 Claims. (Cl. 62-5.)

2,026,214. FREEZING DEVICE. Ralph H. Chilton, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich. Application Nov. 25, 1931, Serial No. 577,222. Renewed April 10, 1935. 16 Claims. (Cl. 62-108.5.)

2,026,227. METHOD AND APPARATUS FOR REFRIGERATION. William S. Foraker, Zanesville, Ohio. Application Nov. 26, 1932, Serial No. 644,442. 15 Claims. (Cl. 62-105.)

DESIGNS

98,035. DESIGN FOR A COMBINATION REFRIGERATOR DISPENSING AND STORAGE CABINET. Richard H. Heise, University City, Mo., assignor to S. G. Adams Co., St. Louis, Mo. Application Oct. 28, 1935, Serial No. 59,247. Term of patent $3\frac{1}{2}$ years.

REISSUES

19,798. REFRIGERATOR STRUCTURE. Lloyd G. Copeman, Flint, Mich. Original No. 2,002,339, dated May 21, 1935, Serial No. 703,744, Dec. 23, 1933. Application for reissue Nov. 7, 1935, Serial No. 48,715. 10 Claims. (Cl. 62-89.)

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

4,211 Electrolux Sold by New Jersey Utility

NEWARK—A gain of 1,132 sales of Electrolux refrigerators by the Public Service Electric & Gas Co. of New Jersey for 1935 over 1934 was reported by company officials recently. Installations totaled 4,211 in 1935 as compared with 3,079 during 1934.

Moser & Suor Holds Salesmen's Course

KANSAS CITY—Moser & Suor, local Norge distributor, has recently completed a comprehensive sales-training course attended by approximately 20 department heads and salesmen. The session, which started Dec. 20 and closed Jan. 6, was held at the Ambassador hotel.

A full course, including regular daily and Sunday sessions was built around the study of the 1936 Norge lines.

Factory representatives from Detroit who addressed the meetings were: William Denzer, who spoke on the new washers and ironers; E. R. Neal of the heating division; Mr. Schornberger of the range division; and W. C. Rowles, manager of the commercial and air-conditioning department.

Dept. Store Men Will Meet At G-E March 10

CLEVELAND—Approximately 250 executives and merchandising managers of department stores from all sections of the country are expected at the fourth annual department store clinic to be held March 10 and 11 at Nela Park here, declares Ralph C. Cameron, head of department store activities of the specialty appliance sales division of General Electric Co.

INFORMAL TALK NUMBER 33



Who Pays the Fiddler when Customers Get Sore?

Somebody must pay the fiddler. And when the customer gets sore . . . when the installation is faulty . . . when the service is bad . . . the dealer or the distributor pays and pays and pays.

There's no fiddler to pay when you hire R-A-C-I Trained men. They are profit producers. First they have been given a thorough understanding of fundamental principles. Second, they are taught through preparatory work at home and actual shop work, how to apply these principles in a practical way. Third, their training is supervised by the industry's own factory engineers, appointed by leading manufacturers, (who have officially endorsed the training) for that purpose.

Employers . . . Ambitious men . . . write for details.

The REFRIGERATION AND AIR CONDITIONING INSTITUTE
2130-2158 LAWRENCE AVENUE • CHICAGO



The Officially Endorsed School

TEMPRITE Starts A Chain of Added Sales

Not only is it profitable to sell the Temprite itself, but each sale starts a chain of additional sales.

The Temprite enables the dispenser to serve beer as it should be served—which increases his patronage.

Then he begins to need other things—keg storage refrigeration—back bar refrigeration—water cooling—food display—Chef's box, etc. Air conditioning follows in a certain percentage. Each new need is an opportunity for a new sale and new profit.

Temprite starts the chain because beer from it brings back the customers for more, increasing the dispenser's business—giving him more profit—more cash to buy.



Temprite is more than a profitable item—it is a sales promoter. For your own advantage see that dispensers in your territory have this chance to expand.

TEMPRITE PRODUCTS CORPORATION
1349 EAST MILWAUKEE AVE. - DETROIT, MICHIGAN
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

MCCORD Refrigeration PRODUCTS

COMMERCIAL EVAPORATORS

DOMESTIC EVAPORATORS

CONDENSERS

METLFLEX ICE TRAYS

SPIRAL FINNED TUBING

AIR CONDITIONING SURFACE

MCCORD RADIATOR & MFG. CO. DETROIT

Commercial Uses

Methods of Making Commercial Equipment Installations

CHICAGO—Recommended methods for making the best type of installations for a wide variety of commercial refrigeration applications are described in "Work Sheet No. 11—Commercial Refrigeration Series" of the Refrigeration home study course prepared by the Refrigeration and Air Conditioning Institute of this city. The lesson tells the problems that are to be met in various types of installations, and explains the best hookup for each particular type.

Market Installations

A combination of cooling units for a walk-in cooler and two separate display cases is shown in Fig. 1. All these units work at the same temperatures and none of them have any unusual load conditions. Consequently we find no two-temperature valves or other special controls.

However, we do have one special condition to look out for in this general type of installation, that being the length of suction lines and the pressure drops in these lines. The cycling control is here assumed to be of the pressure type connected to the low side of the system at the compressor crankcase or near the main suction line connection.

If any of the tubing running to cooling units is much longer than the runs to other units we will have excessive drops, and the actual working temperatures and refrigerant pres-

sure so that any liquid line or suction line can be turned on or off without interfering with the other lines.

Fig. 2 illustrates a combination of fan type unit for the walk-in cooler and finned coils for two display cases, a situation you quite often find where the customer already owns display cases not suited for forced draft units but where the larger cooler is easily rearranged for forced circulation.

In such an installation we generally have all the units operating on a defrosting cycle. If none of them have to carry any unusual peak loads it is possible to have satisfactory operation in multiple as shown.

Of course, the fan type unit will operate at a higher temperature than used for the finned coils, this being a characteristic of fan units. This makes it necessary to use some form of two-temperature valve for the higher temperature unit, and since we want defrosting cycle operation the two-temperature valve will be of the snap-action type or else of the solenoid

of cooling and raises the electric power bill. Small recesses and alcoves may be quite cool before the installation of any machinery in them, but after a condensing unit is placed there the temperature may run quite high. All of the heat removed from the cabinets is dissipated at the condenser and to this heat is added all that produced by the moving machinery and by the heat losses in the driving motor. If a small confined space must be used you should arrange for plenty of ventilation by so locating the fan that air will be drawn in at the bottom of this space and discharged from the top back into a larger space. Protective hoods always should be made of lattice work or with wire screening, never of solid partitions.

Water cooled units do not require so much care in selecting a cool location, although even with these types there is quite a bit of radiation to the surrounding air and the efficiency will be somewhat improved by moderate room temperatures. We also have to consider that in a few cases the condensing unit may be located in a place which is too cold, such as an unheated basement, a garage or other location in which winter temperatures may drop very low. A water cooled unit may freeze and break some of the parts, and refrigerant may condense to a liquid in the compressor crankcase and suction line.

The condensing unit usually is mounted on a base built up with wood framework, with masonry, or with concrete poured into a wood form and carrying mounting bolts correctly placed to fasten the unit. Such a mounting is illustrated in Fig. 3.

If a wood wall is convenient, the manifold and valve panel may be formed by attaching the parts directly to the wall. If the surface is brick or concrete you will have to make holes, usually with a star drill and hammer, then plug them with wood and attach your panel board with lag screws into the wood plugs. You may also use various patented devices for holding screws or nails in holes made into masonry. You will improve the appearance of this board by covering it with some fast drying paint which will show off the valves and other fittings.

Restaurants and Hotels

In restaurant and hotel work the refrigerator must be capable of keeping foods cold enough to be palatable to the customers. The temperatures do not have to be so low as in market and grocery refrigerators but the B.t.u. load often is much heavier because of frequent opening of service doors and because a great quantity of food may be put into the refrigerators and taken out during the busy periods. Furthermore, the room temperature around the restaurant refrigerator often is much higher than that around the units in markets and groceries. These are some of the points to be checked carefully when handling a restaurant job.

Restaurant installations often include many rather special types of equipment, and in many cases the refrigerating units of various types are built in order to suit the exact requirements of each job. Typical equipment may include a large reach-in cooler, an ice cube maker as a separate unit, a special restaurant type of cooler for milk, cream, water, and butter, and finally a separate salad counter. In a small restaurant requiring only a small number of ice cubes we might use a household style of evaporator to handle the cube trays in addition to the food load.

A salad counter or salad pan is arranged with an open top so that the foods displayed are open to the room air at one side. The dishes may be placed on a solid cake of ice in which are the cooling coils, or on cracked ice around the coils. The sides and bottom of the pan are well insulated with about three inches of corkboard or its equivalent. These units are also made up with a flat brine tank having the refrigerant coils attached underneath the top surface to maintain ice and frost on the top surface. The pans are made about four or more inches deep, of any desired width, and up to about six feet in single units.

Sometimes a compartment underneath the pan is refrigerated from the same coils, the underside of the pan being uninsulated but the lower compartment being insulated as with any other refrigerator space. Well insulated pans will require refrigeration capacity of about 1½ B.t.u.'s per hour per degree of temperature difference for each square foot of top surface exposed to the air.

This general method of refrigeration is possible because the chilled air within the pan sides tends to remain down inside the enclosure since it is much heavier than the room air. Pans or counters similar in construction to those for salads and desserts are also used for displaying fish.

Restaurant installations often consist of so many different types of refrigerating devices that we have a wide range of temperatures and loads.

The range often is so great that it is more economical from the operating standpoint, also more satisfactory from the service standpoint, to divide the units into two groups with the higher temperature pieces in one group and

Use of Two-Temperature Valve

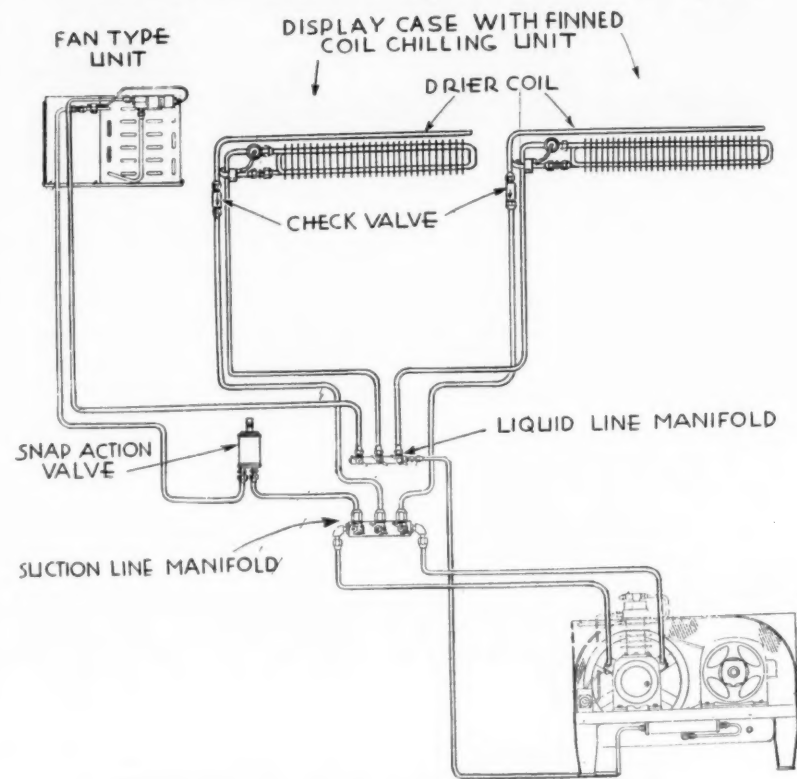


Fig. 2—Units requiring two-temperature controls.

the lower temperature ones in a separate group. Then each group is handled by its own separate condensing unit.

As an example, we might find a restaurant temperature of say 34° F. in a water cooler, a temperature of 25° F. in a food cabinet coil, a temperature of 20° F. in a bottled beverage cooler, one of 10° to 12° F. in a salad pan, and finally a temperature only three or four degrees above zero in an ice maker. It would be uneconomical and might also lead to operating difficulties to attempt handling everything from a little more than zero up to a temperature above freezing with a single condensing unit.

A logical division would be to run the food cabinet coil and the water cooler in multiple from one condensing unit, and the remaining three coolers from a second condensing unit.

Each unit in the low temperature group of Fig. 4, including bottle cooler, salad pan and ice maker, will operate frosted at all times. The ice maker will subject the system to a heavy peak load when a fresh charge of water is put into it, but the temporary high temperature will do no harm because the bottle cooler represents only a small part of the total load and its temperature range is not at all critical. Also, the bottle cooler runs at a temperature enough higher than that of the ice maker that beverages will receive satisfactory cooling even while the ice maker temperature is being pulled down.

The beverage cooler suction line is fitted with a temperature regulating valve because this unit operates at the

pressure as the ice maker.

The load on the pan is so great, due to the surface exposure, that its actual operating temperature will be higher than that in the ice maker so far as the displayed foods are concerned.

In the high temperature group of Fig. 5, the water cooler operating at 34° F. will not be frosted and the cabinet coil runs at a temperature high enough so it won't be permanently frosted. The temperature difference between these two devices is great enough to call for a temperature regulating valve on the water cooler, operating at the higher temperature.

This valve will be adjusted to hold the desired temperature in the water cooler, and the pressure control will be set to regulate the temperature in the cabinet coil.

Ice Makers

Ice making is somewhat different from the chilling of foods because it involves removal of latent heat as well as of sensible heat. The ice forming compartments generally are filled with tap water at temperatures between 60° and 70° F. If the water is at a temperature of say 65° F. it will have to be lowered to 32° F. before freezing, a difference of 33° F.

Then, to change the water into ice we will have to remove 144 B.t.u.'s of heat from each pound of water. If the ice is to be kept for any length of time, its temperature will have to be lowered from 32° F. to something like 15° F., a difference of 16°. The total load per pound of water changed to 15° F. ice then will be:

Water cooled from 65° to 32°, difference of 33° at 1 B.t.u. per lb.	33 B.t.u.'s
Freezing at 32°, taking 144 B.t.u.'s per lb.	144 B.t.u.'s
Chilling ice from 32° to 15°, difference of 17° at 0.5 B.t.u. per lb.	8½ B.t.u.'s
Total, per lb. of water changed to 15° ice	185½ B.t.u.'s

highest temperature in the group. The salad pan requires no separate control and operates at the same suction

In addition to this load of 185½ B.t.u.'s per pound we have the leak- (Concluded on Page 25, Column 1)

No Special Controls Required

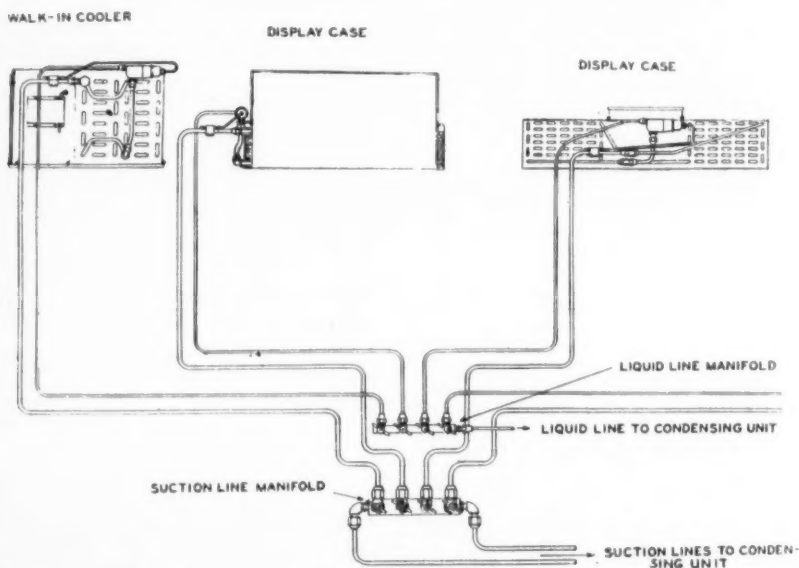


Fig. 1—Combination of cooling units requiring no special control.

ures in the units with the long runs will be too high. We have two ways of equalizing the pressure drops. We may use larger suction line tubing for the longer runs or for those carrying the heavier refrigeration loads, or else we may rearrange the apparatus so that the condensing unit is nearer the load center or is nearer to the unit having the greater cooling load.

The liquid line and suction lines are each connected to a manifold and from these manifolds separate liquid and suction lines run to each display case. Valves are located at the mani-

type. The low side pressure control then will be set for the relatively low temperature and pressure in the finned coils.

Because we may here have considerable difference between the temperatures and pressures in the fan type unit and in the finned coils, we will install check valves at each of the finned coils to prevent high pressure refrigerant vapor from backing up into the finned coils on the off part of the cycle.

In making a market installation, or for that matter any other installation, it will pay you well to take a little time to plan the location of the condensing unit and manifold panel, to determine where piping will be run for water lines on a water cooled job, and to determine just where and how you are going to run the liquid suction lines to the several units in the multiple installation.

It is always preferable to place the condensing unit below the level of the lowest cooling coil, usually in a basement, but sometimes on the same floor with the refrigerators. In rare cases it is possible to make an outfit work satisfactorily with the condensing unit located above the refrigerators, but since you are almost certain to have oiling trouble sooner or later this type of installation should be avoided.

Oil cannot be drawn upward through a suction line for more than a very short distance, and if the compressor is too high a great deal of oil will eventually get out of it and collect in the cooling coils at the lower level. This is likely to damage the compressor and also reduces the available refrigeration capacity in the coils.

The location of an air cooled unit with reference to surrounding temperatures is very important because every degree rise in average room temperature lowers the efficiency of the equipment, makes the compressor run longer for a given amount

AIR CONDITIONING and COMMERCIAL WATER COOLING (Coolers Only)

SHELL & TUBE TYPE

1-100 Tons
1-4 Compressors
F-12—Methyl

STORAGE TYPE

All Sizes

WATER FILTERS

FILTRINE MFG. CO.
Brooklyn, N. Y.

Manifolded Installation

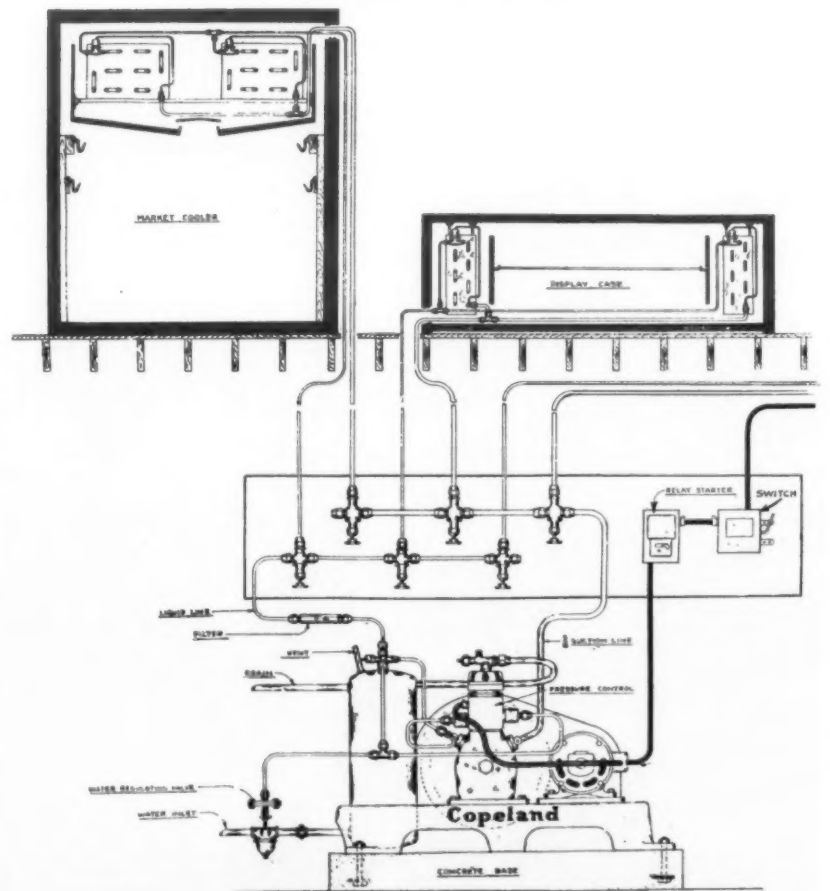


Fig. 3—Manifolding connections for market installation.

Methods of Hooking Commercial Units Up

(Concluded from Page 24, Column 5)

age load of the freezer or ice maker during the process. If the temperature of the water used for filling cans or trays is higher than the 65° F. assumed here, the total load will be proportionately higher. For example, were the water to be at 80° F. we would have a difference of 48° F. instead of the above 33° F. in chilling it to the freezing point of 32° F. and our total load would be 200½ B.t.u.'s per pound.

The approximate heat leakage of well constructed block ice makers in B.t.u.'s is shown by the following table. As with all other refrigeration, the leakage increases with rise of room temperature. As would be expected, the freezers of large capacity have less leakage per pound of ice frozen

Leakage Loads of Block Ice Freezers per 24 Hrs.

Room Temp.	50	100	150	200	300	400	500
80°	6,500	7,400	8,400	9,500	11,800	14,500	17,500
90°	7,500	8,600	9,900	10,800	13,400	16,300	19,600
100°	8,650	9,800	11,000	12,250	15,100	18,350	22,300

than have the smaller sizes. These leakage loads do not include the load for freezing the ice, but must be added to the freezing and ice-chilling load which is separately calculated.

When only a small amount of ice is needed, a standard ice-making coil may be placed in a cooler along with the regular finned coils. The ice-freezing coils also may serve the purpose of refrigerating part of the cabinet equipment in addition to making the ice. When large quantities of ice will be needed it is customary to use tank type freezers with circulating brine.

Cans which freeze ice in 25 or 50 pound cakes are immersed in the brine tank. The cans are filled with water to the top. With all the cans in place, the level of the brine should be up to the grid or cover through which the cans are inserted. The brine is maintained at a temperature of 10° F. The tank is heavily insulated, a typical specification being four inches of cork-board in the sides and ends, five inches in the bottom and two inches in the cover.

These units are generally operated to make one freezing per day, the time for which varies with the thickness of the ice cakes, the temperature of the water when put into the cans, the temperature of the brine, and the capacity of the condensing unit to which the ice maker is connected. The condensing unit must be of sufficient capacity to deliver the total required refrigeration within the time allowed for freezing. The principle used in these bulk ice freezers is practically the same as that employed in large ice plants.

The brine tank is usually constructed of galvanized sheet steel with riveted and soldered joints. The refrigerant coil is supported by a rack around the inner surface of the tank and is immersed in the brine solution. Enough calcium chloride is added to the brine water to prevent freezing at the temperature of the coil or at temperatures about 10° below that value as a margin of safety.

To maintain a brine temperature of 10° F. the refrigerant temperature at evaporation will be about zero, therefore the brine should not freeze at temperatures higher than about -10° F. This would require about 22 per

cent of calcium chloride by weight in the brine. Too much of the salt will cause sluggish circulation of the brine over the coil and around the ice cans.

To prevent the brine solution from attacking and corroding the metal of the tank and cans these parts are covered with a brine resisting paint. The tendency of the brine to corrode the metal surfaces may be reduced by adding two ounces of sodium chromate to each gallon of brine solution. The sodium chromate is dissolved in a little water before being added to the brine.

Freshly prepared brine is alkaline, not acid. As the solution continues to be exposed to the air, it gradually absorbs some carbon dioxide and after a period will change from an alkaline to an acid solution. Acid attacks the metals quite rapidly.

The less the brine comes in contact with air and the less air becomes mixed into the brine solution, the less

trouble there will be due to corrosion over long periods of use. When the brine is agitated in the tank to increase the rate of circulation, air will be mixed into the liquid if the agitator is operating at too high speed so that air is drawn in by the blade.

The stuffing glands of brine pumps should be kept well packed and correctly tightened because otherwise there is some danger of air being drawn into the pump by the suction produced. Sometimes the brine return pipe is high enough above the level of the solution so that the liquid splashes, and of course this introduces air. The brine level should be raised or the pipe opening should be lowered.

There are also brine circulators, or agitators which are installed either vertically or horizontally in the brine tank. These circulators have a long shaft extending into the brine and on the end of this shaft is mounted a propeller which is very much like the kind used on a motor boat. The vertical circulators are usually direct connected to an electric motor mounted at the top while the horizontal circulators are usually installed so that their shafts extend through the side walls of the tank and several may be belted to the same motor. The use of vertical circulators eliminates the use of stuffing boxes in the side wall of the tanks.

Florist Cases

The load in an average florist display case is a rather light one, since the bulk of flowers is small in relation to the space occupied. Also, the most desirable temperature is in the neighborhood of 50° F. At temperatures more than 5° below this point flowers are so affected that they will quite quickly after being brought out into ordinary room temperatures. At temperatures more than 5° above the desired value the blossoms may open into full bloom while inside the case. Florist cases are vented from the bottom to carry off excess carbon dioxide gas, which is much heavier than air.

Fur Storage

Rooms for storage of furs are generally maintained at a temperature

of about 40° F. Unit coolers of the fan type may be used to circulate the air and hold the desired temperature. Some installations have either brine piping or direct expansion cooling coils located in the storage room with circulation maintained by gravity as chilled air falls and the warm air rises.

It also is possible to place the cooling coils, either brine or direct expansion, in an adjoining room used somewhat like the bunker space in a cooler, but usually with circulation assisted by fans or blowers.

The larvae of the moth, and not the moth itself, is what eats furs and damages them. The larvae are practically without motion at the storage temperature of 40° F., but this temperature does not kill them.

Experiment has shown that one of the most effective methods of killing is to hold the temperature at 18° F. for several days, then raise it quickly to 50° F. for a short time. Repeating these temperature changes several times destroys the larvae and then the furs may be stored indefinitely at the regular temperature of 40° F. The refrigerating methods mentioned may be adapted to making these temperature changes.

Ordinarily the load in a fur storage room is due chiefly to leakage through the walls and to the somewhat infrequent opening of service doors. If the quick temperature change system is to be used, the load will be considerably increased by repeatedly lowering the room and its contents from 50° to 18° F.

Furs never should be stored at temperatures above 45° F. because under such conditions the larvae quickly resume normal activity.

Bakery Jobs

Refrigeration enters into the work of a large bakery in many ways, both in storage of raw materials and in the manufacturing or mixing processes. Yeasts, shortenings, milk, butter, eggs, and fruits are stored in coolers at about 40° F. Finished products, ready for delivery, are held under quite high relative humidity, about 75 per cent, and at a temperature of about 85° F.

Several sources of heat are involved in the mixing of bread dough. The flour itself has a specific heat of 0.42. Motion of the mixer arms through the dough generates heat in proportion to the motor power used for this work. The uniting of the water with the flour produces heat at the rate of 6.5 B.t.u.'s per pound of flour. To carry away the excess heat the mixer is water jacketed and water at around 40° F. is circulated through the jacket.

The water used in the dough is added while at a temperature of about 35° F., all the water temperatures being controlled so that the dough leaving the mixer is at a temperature of 80° F. cake dough should leave the mixer at about 65° F., which calls for different control of water temperatures.

Mooney to Head District Commercial Sales for G-E

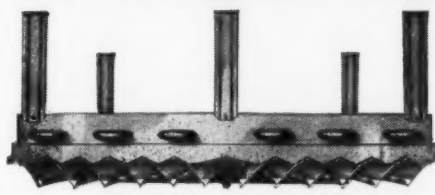
CHICAGO—Mark Mooney, formerly supervisor of commercial sales for R. Cooper Jr., Inc., Chicago distributor of General Electric appliances, was recently appointed G-E commercial district representative in the north-eastern district.

Mr. Mooney has been supervising commercial sales at Cooper's for three years.

The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

PEERLESS FLASH COOLER



The NEW Eye Appealing Method of Cooling Walk-In Refrigerators

STYLE & RESULTS

Fin Coil and Drip Pans Engineered in an Integral Unit—Saves Installation Cost and Operating Cost

PEERLESS ICE MACHINE CO.

CHICAGO TWO FACTORIES NEW YORK
515 W. 35th St. 43-00 36th St., L.I.C.

REFRIGERATOR CABINETS

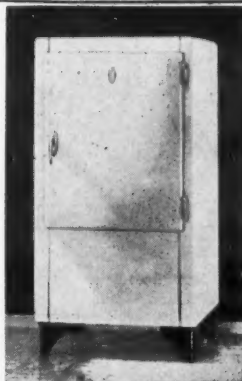
4 to 14 Cu. Ft. Models in Stock

Also Specials for that Hard-to-Fit Location and For Apartments

Custom-Built at Production Prices

HEINZ & MUNSCHAUER, Buffalo, N.Y.

Makers of Quality Refrigerators Since 1865

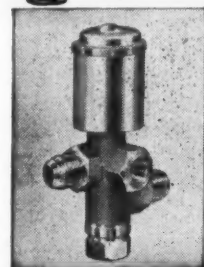


REMPE FIN COILS

CHICAGO STATION D

Pipe Coils and Bends

STANDARD REFRIGERATING APPLIANCES



TWO TEMPERATURE VALVES with BUILT-IN CHEEK

Write for bulletin on complete line covering refrigerating appliances, liquid line filters, dehydrators, acid neutralizers, standard parts and materials, service tools, shaft seals, bearing metals and parts. Descriptive literature will be gladly furnished on any or all of these lines on request.

AMERICAN INJECTOR COMPANY 1431 14th Street, Detroit, Mich.

KRAMER

UNIT COOLER

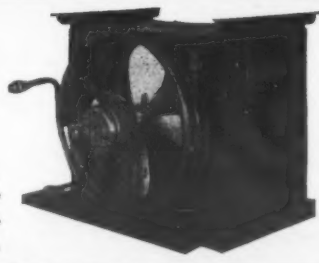
Manifolded for FREON

and greater than 20° air to refrigerant differentials. Maximum Fin Coil Surface on 5/8" O. D. Tube. All Copper. Casing Brass. Entirely non-corrosive.

COOLERS — EVAPORATORS — CONDENSERS — COOLING COILS

TRENTON AUTO RADIATOR WORKS

210 West 65th, N.Y.C. TRENTON, N.J. 5114 Liberty Ave., Pittsburgh, Pa.



TYPE KR—12 MODELS

RANCOSTAT

—the Stainless Steel Thermostat

Some people tell us that Stainless Steel is the most important improvement ever put in a thermostat. Others say that nothing equals the Ranco way of building the overload coil. Still others point to bellows construction as the outstanding Ranco feature. We say this: Every detail is important. Send for KR Bulletin and see just how the Ranco-stat is built.

The Automatic Reclosing Circuit Breaker Co. Columbus, Ohio

Refrigeration Instruments by Marsh



Jas. P. Marsh Corporation
2067 SOUTHPORT AVE., CHICAGO, ILL.

Combination of Low and High Temperature Units

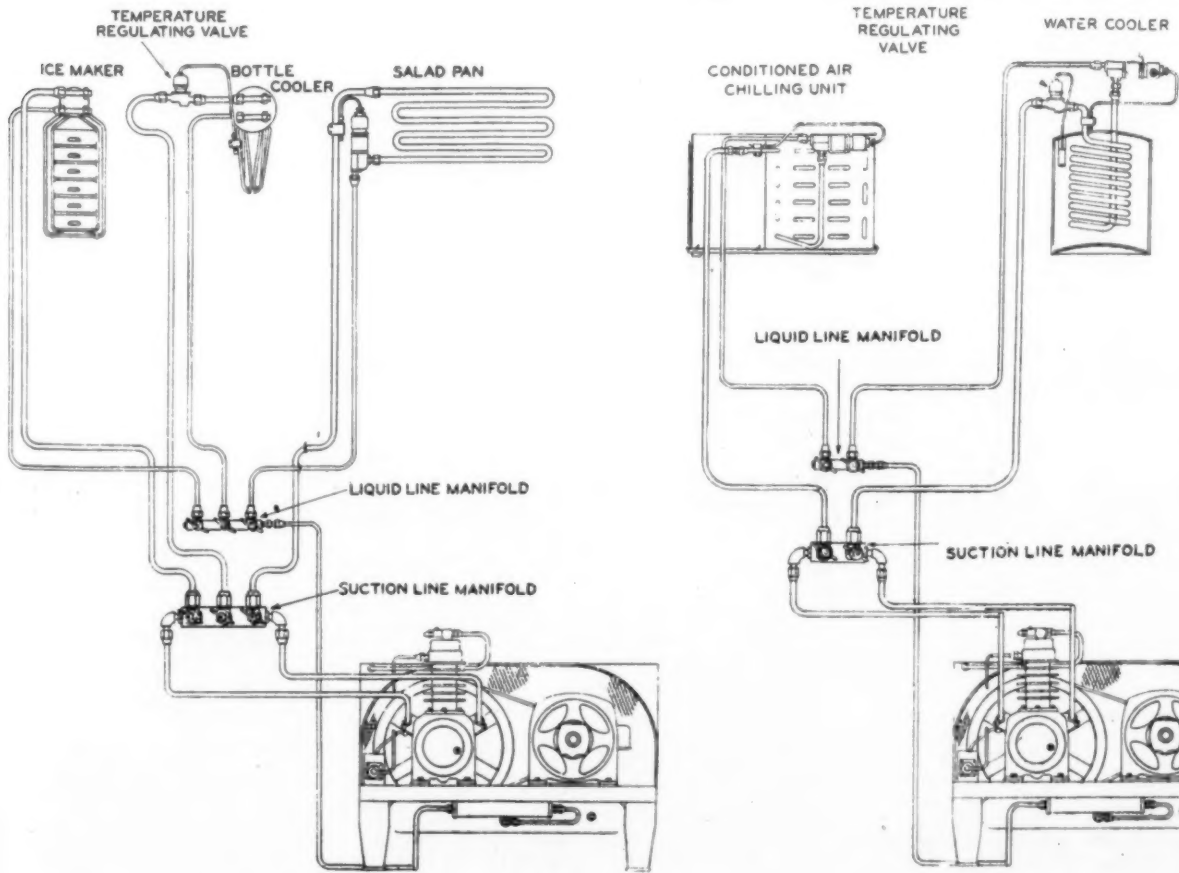


Fig. 4—Combination of low temperature units.

Fig. 5—Multiple connection of higher temperature units.

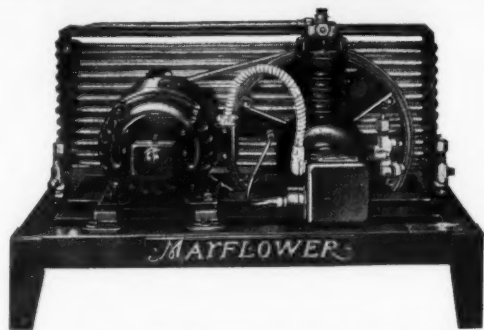
The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

HARDY "Mayflower" Compressors

exclusively manufactured for Commercial use, are the units which have long met with general approval.

For dependability and genuine satisfaction, dealers are recommending this equipment

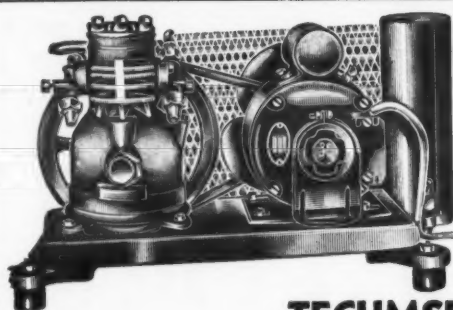


HARDY MANUFACTURING CO., Inc., 100 Davis Ave., Dayton, Ohio

CONDENSING UNITS AND COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY

JOMOCO, INC.

A SUBSIDIARY OF THE
JOHNSON MOTOR CO.
Waukegan, Ill.
CABLE ADDRESS: JOMOCO-WAUKEGAN



"CHIEFTAIN" QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

All bearings diamond bored. Positive lubrication of piston by newly developed process plus forced feed lubrication in all models.

Sizes: 1/6, 1/5, 1/4, 1/3 h.p.

Write for prices

TECUMSEH PRODUCTS CO.
Tecumseh, Mich.

1935

REFRIGERATION AND AIR CONDITIONING DIRECTORY

The
REFRIGERATION
LIBRARY . . .
VOLUME 1

BUSINESS NEWS PUBLISHING CO.
Publishers of
ELECTRIC REFRIGERATION NEWS

The **DIRECTORY** (380 pages, \$3.00 per copy) is the industry reference book for all known sources of supply for refrigeration and air-conditioning products. Next edition will be published July 1, 1936.

Every sales executive should have the **MARKET DATA BOOK** (304 pages, \$3.00 per copy) for its compilation of sales methods and sales figures recording industry development to date. Next edition to be published Sept. 1, 1936.

Combination Price for Both Books, \$5.00

1935

REFRIGERATION AND AIR CONDITIONING MARKET DATA

The
REFRIGERATION
LIBRARY . . .
VOLUME 2

BUSINESS NEWS PUBLISHING CO.
Publishers of
ELECTRIC REFRIGERATION NEWS



HENRY FLARING TOOL

Expansion screw takes up wear in cam head

The flaring tool that is the fastest and easiest to operate! Sturdy and lasts longer. Adjustable cam lever locks the tube in place in carbonized clamping blocks. Greatest locking pressure is always exerted directly opposite the tube. For 1/4", 5/16", 3/8", 1/2" and 5/8" tubing. Each, \$4.55.

HENRY VALVE CO.

1001-19 N. Spaulding Ave., Chicago, Ill.

IF YOUR JOBBER CAN'T SUPPLY YOU, ORDER DIRECT

BINDERS

For back issues of the News

We offer a binder designed and made especially for keeping your file copies of Electric Refrigeration News neat and always available for ready reference. It is made of stiff board covers, attractively bound in good quality of black imitation leather. The name Electric Refrigeration News is stamped in gold on the front cover and backbone.

The price is \$3.75 shipped to you post paid in the United States and Possessions and Pan-American Postal Union countries. For all Foreign countries postage based on a shipping weight of 6 pounds must be added to this price. Send your remittance with order. May we send you one?

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

PURO ELECTRIC WATER COOLERS

Thoroughly reinforced all steel attractively finished cabinets.

Different models of varying capacities.

Write for details and sales prices.

Puro Filter Corporation of America

440 Lafayette Street, New York City

Spring 7-1800

Jones Explains Demonstrator Plan of Selling at Distributor Convention

(Concluded from Page 1, Column 2) carried on both in Chicago, at the old plant, and in Indianapolis, until the latter plant is able to assume full production load.

Another interesting disclosure made during the convention was the fact that F-M is planning to increase its dealer organization and obtain fuller coverage by going after representatives in the smaller cities and towns, where the name Fairbanks, Morse & Co. is even better known than it is in metropolitan centers, by virtue of the scales, motors, and other farm machinery with which the company has been serving these areas for more than 100 years.

Optimism Rules Meeting

Optimism was the keynote of the convention, as Vice President W. Paul Jones ran it right off on schedule. Optimism was in every distributor's eyes and on most distributors' lips before the 1936 Conservadors were fully displayed, midway in the morning session.

Surest index of distributor interest was the fact that everybody was there on time.

Welcomes to distributors were delivered by Mr. Jones and by President Mortimer Frankel, who pointed with pride to F-M's 1935 sales record, its first full year in the industry, and predicted even greater things for 1936. Conservador, of course, was the pivot about which the speeches—as well as the whole convention—revolved.

For many of the distributors, this was the first Fairbanks-Morse convention. So Mr. Jones lost little time in preliminaries. As quickly as the welcomes and a quick once-over of the refrigeration situation were done with, the new line of F-M products was introduced.

This was effectively done in a skit prepared by Henri Hurst McDonald, F-M advertising agency, and A. L. Decker, its account executive. They had a housewife "discover" the line, and go into raptures as each of its 15 features were described. The presentation served a double purpose—bringing features to the attention of distributors, and at the same time showing them the particular ones with which the average housewife would be most impressed.

What New Line Should Do

Mr. Jones followed with a summation of what distributors should be able to do with the '36 Conservador "C" line in the "quality" market, and with the "B" line in the middle-class competitive price market. Combination of the two, he emphasized, gave F-M distributors and dealers a two-edged selling sword which should cut a wide path through any sort of competition.

Frank D. Peltier, recently-appointed chief engineer for the company, went over the mechanical changes in the line, pointing out the extra heavy base used in "C" models, the channel steel sides, the valve-in-head unit, machined for smaller clearance and a consequent increased efficiency, the thicker Balsam Wool insulation, the thermostatic expansion valve which replaces the automatic valve used last year, and the added convenience of the easier-to-remove Conservador basket.

Since many of the distributors were new in the field, a second playlet demonstrated to them how a distributor, really "sold" on Conservador, can go about building up his dealer representation to top efficiency. The actor-distributor went through his presentation, building up the F-M feature story as he went along, and the "dealer" shared his enthusiasm and signed readily.

Demonstrate—Theme of Drive

"Demonstrate!" will be the theme of Fairbanks-Morse's merchandising and advertising campaign—and advertising will be designed to directly influence sales, not to sell the idea of refrigeration or to create an atmosphere of prestige. Copy will be of the hard-hitting direct-selling type, and will be divided into four general groups:

1. National advertising.
2. Local advertising.
3. Distributor to dealer promotion material.
4. Dealer to consumer promotion material.

Explaining F-M's advertising and promotion plans for 1936, Advertising Manager Walter R. Ceperly told distributors: "Remember, you're selling intangibles as well as merchandise. You're selling not only a refrigerator—you're selling stability, dependability, beauty, and economy as well; and you're selling the name of Fairbanks-Morse—a name known to industry for more than 100 years."

Opening shot in the national advertising campaign will be fired in the Jan. 25 issue of *Saturday Evening Post*, and will be built around Conservador as an economy feature. "Since I can have Conservador . . . I refuse to pay the penalty of the open door," the copy runs.

This "penalty of the open door" theme will run through all of the

company's national advertising in magazines and newspapers as well. In addition to the *Post*, *Collier's* and *Good Housekeeping* will carry the national magazine campaign burden. Fairbanks, Morse & Co. will also have a series of 13 institution ads in *Time* magazine, in which the home appliance story will be prominently mentioned.

Aid of Magazine Advertising

National magazine advertising is aimed at two things, Mr. Ceperly pointed out: dealer influence and consumer influence. Creating dealer influence will result in increased distribution facilities; creating consumer influence, in greater sales.

Local dealer advertising will be an important part of the Fairbanks-Morse promotional picture. Particularly important will be the stress on cooperative campaigns.

"Cooperative advertising should be hard-hitting, and should be considered only in the light of its dollar-for-dollar value. It must produce sales, or it has failed its purpose," Mr. Ceperly declared.

Fairbanks-Morse is limiting its cooperative advertising to two fields: newspaper, which will get about two-thirds of the total budget, and radio, which will come in for the other third. Dealers will be asked to share local advertising expense, to insure more careful use of advertising funds.

A prepared series of newspaper ads, with economy as the theme, is available to dealers for individual or cooperative use. These will tie in with the national theme, and will create a mass selling effect.

Plan of Credit Funds

To help them start their 1936 advertising campaigns early, distributors will be credited with funds, based on their 1935 sales and their estimated 1936 sales.

Consumer literature is grouped into four general themes, all designed to lead directly to sales: economy, beauty, the Conservador, and the Fairbanks-Morse background of 106 years service.

The literature is pointed direct to demonstration by the dealer of the Conservador and other F-M features, on the theory that "if you can demonstrate it, you can sell it." Included in the literature is a three-piece direct mail set, another series which can be used either as a mailing piece, an envelope insert, or a handout, and a broadside useable either as a window poster, a wall poster, or a mailing piece.

For the dealer F-M offers background floor display pieces, which set off the refrigerator to best advantage; three individual window or store show cards, which can be used either singly or together; a window streamer, and the "15 star" demonstrator book, which permits a dramatic demonstration by any salesman, and sticks the "stars" on the refrigerator door, where the prospect can't help noticing them. The stickers, of heavy gummed paper, may be used over and over, and are washable.

Demonstrator Sales Book

The demonstrator sales book was characterized by Mr. Jones as "the answer to the canned selling talk," and as "the most powerful punch ever put into a piece of promotion material." Conservador, he reminded distributors, is the only feature which must be used every time the refrigerator is used—and he urged them to make the most of it.

Harold Glasser, manager of the refrigeration department of Bruno-New York, Fairbanks-Morse distributor, told the other distributors how his firm sold 15 per cent of all Conservadors sold in the United States last year.

There are four essentials of a successful product, Mr. Glasser told his fellows:

1. An honorable name; 2. a good product, with an outstanding feature; 3. competitive price; and 4. dependability, which insured repeat business.

"Conservador is your answer to mail order house competition," Mr. Glasser declared. "Meet this competition with something new, something outstanding, and you'll outsell it."

Another distributor, Ben Menard of Menard-Coen, Inc., Chicago, told how his company had been successful in lining up good dealers in a metropolitan area.

Third and final skit of the convention was next presented, and demonstrated how a salesman uses the "15 star" demonstrator book in dramatizing his sales story and getting the order.

Service information closed the sessions. While this item is no longer the bugaboo it once was, Mr. Jones told the distributors they must interest themselves in it, and see that their dealers do their share to keep all Fairbanks-Morse appliances running in tip-top shape.

Comment

By F. M. Cockrell

(Concluded from Page 12, Column 5)

Even the efforts of the movies to dramatize business executives in action are usually pitifully inadequate.

Why Public Misunderstands

When we consider the fact that most people never have an opportunity to get even a faint glimpse of the inside workings in the executive offices of a big corporation, it is not surprising that the motives of business men are misunderstood.

Even the pictures published in the News, taken at banquets, meetings, and office conferences, are only a few shades better. They still do not tell what business men talk about and they are a long way from what executives worry about in their own offices.

Certainly George's candid snapshots have been a big help in giving the readers of the News a closer up view of the top men and others who are taking an active part in guiding the destinies of the industry. But we still have a long way to go before we find out how to present a true picture of the industry in action.

The Sleeping Salesman

For one thing, I have an idea that it would be very interesting to get more pictures of dealers, salesmen, and service men in action under natural conditions, such as can be shown only when the subjects do not know that their pictures are being taken.

I remember that George took one picture, which was published in the News, showing a lone salesman sound asleep in a big display room. We were criticized for publishing that picture on the ground that the salesman would probably lose his job.

If the salesman's boss did take that hasty action, he probably made a mistake.

The salesman was there to wait on customers who came into the store and he had probably been waiting so long for a customer to come in that his mental alertness had simply dropped to zero.

New Promotion Ideas

What that store needed was some better advertising, better sales promotion, better window displays, or a better merchandising plan to get people into the store.

I have an idea that if we can get enough samples showing dealers and salesmen in action under normal conditions it would stir the imagination of the alert promotion departments in the manufacturing centers.

Perhaps it would suggest opportunities for some bigger and better advertising in the News directed to dealers and salesmen.

Refrigeration manufacturers have already done a truly marvelous job of training sales organizations but they are always searching for new and better methods.

Good Reporter Wanted

Which reminds me to mention that I have received several applications as result of the statement in this column a couple of weeks ago that "we need another good reporter on the News."

So far, most of the applications have been from young men who have never had any reporting experience but who feel sure that they could learn how in short order, because they would like very much to become the editor of a live trade paper and make a trip around the world.

One applicant writes that he would like to reverse the program, since he has already done his traveling in foreign parts and would now like to try his hand at journalism.

Send Your Clippings

To others, who may be interested in applying for the position, please send clippings showing that you have written something and that it has been printed somewhere.

If you never wrote anything for your home town newspaper, your high school or college publication, or your company house organ, it is obvious that you do not have the urge to write.

It is problem enough for us to teach a newcomer on the staff what to write for this highly specialized industry paper. We simply do not have time to teach him how to write.

Also, we would like for that next "good reporter" to be handy with a camera.

Classified

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

EXECUTIVE TYPE salesman with electrical merchandising experience wanted by prominent California distributor. President will interview men while on eastern trip in near future. Please give full particulars of experience and references. Box 756 Electric Refrigeration News.

WANTED commission men calling on refrigeration and washing machine trade, to handle Goodyear V-belts for replacement. Exclusive territories still available. Liberal commission. Prefer men selling allied lines. Write in detail to Detroit Rubber Products, Inc., 35 Parsons St., Detroit, Mich.

WANTED: Experienced air conditioning engineer to assist sales manager of the Air Conditioning division of old established refrigerating manufacturer, located in middle west. Box 758, Electric Refrigeration News.

POSITIONS WANTED

PRACTICAL ENGINEER desires position operating boiler, steam, mechanical or low pressure refrigeration plant in apartment or business establishment. Has had technical and practical training with several refrigerants. At present operating small refrigeration service station. Not particular about location. References furnished on request. Box 755, Electric Refrigeration News.

FRANCHISE AVAILABLE

JOBBER representation to handle nationally advertised line of ice cream cabinets and replacement parts for all makes of cabinets. Must be able to carry small stock on exclusive representation. Territories available west of Mississippi River and in the South. Write full details. Box 759, Electric Refrigeration News.

EQUIPMENT FOR SALE

DEALERS AND SERVICEMEN. We sell used refrigerators "As Is". Recondition and spray them yourself and save money. Used Kelvinators \$19.00, Frigidaires \$25.00, Copelands \$22.50, Servels \$19.00, Ice-O-Matics \$39.00, also General Electric, Westinghouse, Electrolux and many others. Some all porcelain. Pilgrim Refrigeration Co., 43-47 39th Place, Long Island City, N. Y.

TEMPRITES, brand new. Get these now. 40-B-3 \$25.00 each, 30-B-2 \$20.00 each, 30-B-1 \$15.00 each, 40-B-2 \$25.00 each, 20-B-1 \$12.50 each. Automatic Refrigeration Service Co., 1232 14th St., N. W., Washington, D. C.

HERMETIC UNITS REPAIRED

HERMETIC UNITS rebuilt or exchanged: Majestic all models \$17.50, Servel \$22.50, G.E. \$25.00 and \$32.50, other standard makes \$19.50. Majestic Hermetic Dome assembly \$12.50, Majestic standard compressors \$6.50, thermostat or cold control exchange \$2.50. Other prices on request. Six months guarantee. Wholesale only. Refrigeration Products, Inc., 122 W. Illinois St., Chicago, Ill.

REPAIRS

HALELECTRIC control repair service. All makes thermostatic and pressure controls rebuilt. Automatic and thermostatic expansion valves repaired. Refrigerant gases carried in stock for rush shipment. Warren for stuck-up compressors. Rebuilt American Radiator Mercoid controls similar to No. 848, five dollars each. Halelectric Laboratory, 1793 Lakeview Rd., Cleveland, Ohio.

REPAIR SERVICE

MOTORS—Three phase, two phase, or single phase repulsion induction, rewound, including brushes and bearings when necessary. 1/4 H.P.—\$9.45, 1/2 H.P.—\$10.75, 3/4 H.P.—\$11.95, 1 H.P.—\$15.25, 1 1/2 H.P.—\$18.25, 2 H.P.—\$22.50. Motors returned like new mechanically and in appearance. South Shore Electric Co., 8437 South Chicago Ave., Chicago, Ill.

SCHOOLS

AIR CONDITIONING—REFRIGERATION. Taught by a combination of classroom and laboratory work. Over 60 lectures and laboratory set-ups. 5000 square feet, well equipped. Tools and text furnished. Installation, service, design, engineering. Three months' full time course available. Detroit School of Refrigeration, 6517 Grand River Ave., Detroit, Mich.

LARKIN COILS for AIR CONDITIONING

**WE FULFILL A DEFINITE NEED
IN THE REFRIGERATION FIELD**

We Train Men!

Trained men are the greatest asset the Refrigeration Industry can have. There have never been enough properly trained refrigeration men qualified to handle sales engineering, installation and servicing requirements in all distributing areas. Trained men will build this industry quicker than new men can be found to fill new positions.

We are proud of the part we have played in building the Refrigeration Industry to its present vast proportions by constantly supplying it with men trained to promote its further growth. As the leading school in the refrigeration field we offer our services to both those desiring personal training and the services of trained men.

FOUNDED 1927

UTILITIES ENGINEERING INSTITUTE

Questions

Holley Refrigerator Co.

No. 2642 (Exporter, New York)—"Some years ago there was a company in Adrian, Mich., by the name of the Holley Refrigerator Co."

"We would very much appreciate it if you could give us some idea as to whom were the officers of that company and what happened to them, as we want to get in touch with somebody who knows something about the type of refrigerators which they manufactured."

Answer: Can any reader supply this information?

Counter Freezer Group

No. 2643 (Patent Attorney, New York)—"Will you give me the address of the Counter Freezer Association of which Mr. C. S. Clark is secretary?"

"This is the association referred to in the News item at the bottom of column 1 of your December 25 issue."

Answer: Address of the headquarters of the Counter Freezer Association is 1346 Pure Oil Bldg., Chicago.

Liquid-Cooling Devices

No. 2644 (Manufacturer, New Jersey)

"At a recent date we received a letter, at our request, from the Department of Commerce, Washington, D. C., with information that you would be able to assist us in obtaining a list of American manufacturers that manufacture liquid-cooling devices. Our patent pertains to an improvement in liquid-cooling devices, namely cocktail or high-ball shaker, by which we mean to have a cold drink without having the ice mixed with the liquid and is sanitary in serving the drinks."

"We assure you that we should be gratified to have even a small note from you giving us this information."

Answer: Manufacturers of liquid cooling devices are listed in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

This DIRECTORY is published for the purpose of answering such questions, as it is impossible for us to prepare individual lists in answer to the thousands of requests for such information.

The book is divided into four sections: (1) alphabetic list of manufacturers; (2) index of trade names; (3) classified list of refrigeration equipment; (4) geographical directory giving name, address, telephone number, products, and executive personnel of the various manufacturers.

Kerosene Refrigerators

No. 2645 (Manufacturer, Australia)—"I have arranged to obtain the REFRIGERATION DIRECTORY and MARKET DATA BOOK (2 volumes), published by your company."

"In case this publication does not contain all the information which I particularly require at the moment, I would esteem it a favor if you would kindly let me have a list of the names of firms who are actually manufacturing as well as those who are distributing non-electric refrigerators in your country, of the kerosene-burning absorption system type. "I might mention that although I am a manufacturer on a large scale of non-electric refrigerators of the class mentioned above, I nevertheless find a considerable amount of reading and valuable information in your publication, to which, as you know, I am a regular subscriber."

Answer: Manufacturers of kerosene-operated refrigerators are as follows: Electrolux Refrigerator Sales Division of Servel, Inc., Evansville, Ind.; the Crosley Radio Corp., Arlington St., Cincinnati, Ohio; the Gibson Electric Refrigerator Corp., Greenville, Mich.; and the Allyne Refrigerator Corp., c/o Cleveland Tractor Corp., East 193rd St., Cleveland, Ohio.

There is also a gasoline motor-driven refrigerator, which is manufactured by the Waukesha Motor Co. of Waukesha, Wis.

Air-Conditioning Cabinets

No. 2646 (Manufacturer, Illinois)—"We are manufacturers of radio cabinets, and also are in a position to build cabinets for air conditioning."

"We would like to procure some sort of a list of air-conditioning manufacturers and we were wonder-

ing if you have such a list available."

Answer: Manufacturers of air-conditioning equipment are listed in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Tag Switches

No. 2647 (Service Company, Alabama)—"Kindly advise us the manufacturer's name and address who manufactures the Tag switches."

Answer: C. J. Tagliabue Mfg. Co., Park & Nostrand Aves., Brooklyn.

List of Inactive Manufacturers

No. 2648 (Advertising Company, Michigan)—"I recall that some time ago you published in ELECTRIC REFRIGERATION NEWS a complete report showing what manufacturers of electric refrigerators were in business in 1929 and a later report of those who had survived and were still in business five years later. I believe that the report covered the names of the manufacturers who had merged or discontinued during that period."

"I am wondering if you have brought this report up to 1935, and, if so, I would very much appreciate receiving this information as quickly as possible. If you do not have the report brought up to date, please send me a copy of the latest one issued."

"Any other information which you may have containing statistics relative to the position of manufacturers of electric refrigerators—with respect to sales volume, foreign shipments, production, etc., would also be appreciated."

Answer: We have not published a report of manufacturers who have merged or discontinued since Sept. 5, 1934.

We cannot furnish statistics relative to the position of individual manufacturers with respect to sales volume, foreign shipments, production, or other data. They are unwilling to make this information available for use by competitors.

The REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK gives a survey of the entire industry in regard to sales methods, sales records, export figures, production, and all other available data.

Makers of Dehydrators For Display Cases

No. 2649 (Manufacturer, New York)—"We are interested in learning the source of supply for a dehydrator which would be used for the purpose of removing moisture from between the glasses on a refrigerated display case. The type we have in mind is that similar to the one being used by the McCray Refrigerator Co."

"We have consulted the REFRIGERATION DIRECTORY published by you but find no indication concerning this equipment, and we would appreciate it, therefore, if you could advise us as to where equipment of this nature may be obtained that we in turn may pass this information on to one of our export accounts."

Answer: The following companies are listed in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY as manufacturers of a dehydrator which would be used for the purpose of removing moisture from between the glasses on a refrigerated display case:

American Hard Rubber Co., 11 Mercer St., New York City; Arcade Mfg. Co., 1212 E. Shawnee St., Freeport, Ill.; Garden City Plating & Mfg. Co., 1430 S. Talman Ave., Chicago, Ill.; Henry Valve Co., 1001 N. Spaulding Ave., Chicago, Ill.; Imperial Brass Mfg. Co., 564 S. Racine Ave., Chicago, Ill.

Ingram-Richardson Mfg. Co., 32nd St., Beaver Falls, Pa.; Kason Hardware Corp., 127 Wallabout St., Brooklyn, N. Y.; Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh, Pa.; and Silica Gel Corp., Baltimore Trust Bldg., Baltimore, Md.

Room Humidifier

No. 2650 (Dealer, Massachusetts)—"Kindly send us information concerning room humidifiers, small portable type. Low cost. Ease in maintenance."

Answer: Manufacturers of room humidifiers are listed on pages 156 and 157 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Cabinet Hardware

For Export Market

No. 2651 (Manufacturer's Representative, Brazil)—"The writer is anxious to get in touch with a factory making cabinet hardware for commercial and domestic boxes."

"I have written to the American Cabinet Hardware Co. and received a reply that they are not interested in export at the present time."

"Can you recommend any others who are interested in export and who are not tied up through a representation of a manufacturer's agent located in Rio, Sao Paulo, Brazil, and Buenos Aires, Argentina."

Answer: Manufacturers of cabinet hardware are listed on pages 180 and 230 through 234 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

The Buyer's Guide

Suppliers Specializing in Service to the Refrigeration and Air Conditioning Industries

KOCH COMMERCIAL REFRIGERATOR CABINETS

All types and sizes of heavily insulated refrigerators and display cases.

WANTED—DISTRIBUTORS and SALES AGENTS

Attractive sales proposition. Some good territories available. Many exclusive features. Write for information, and submit your qualifications.

KOCH REFRIGERATORS, North Kansas City, Mo.

Another Gloekler Achievement—

THE IDEAL REFRIGERATOR FOR SMALL RESTAURANTS, LUNCH ROOMS, BARBECUE STANDS, ETC.

A practical all-metal Cabinet, white Du Lux, or porcelain finish—3" insulation—perfectly designed coil bunker—retained steel shelving—bright chromium hardware.

Originally a solid 4-door cabinet, the two top doors may be transferred to display type if desired, giving a shelf area of 9 sq. ft. Lower compartment, likewise equipped with shelves, has an area of more than 19 sq. ft.

The model 350 Cabinet has more storage space for its size—68" x 48" x 28"—than any other cabinet—and the price will surprise you.

Sold only through Dealers and Distributors Write for complete catalog

GLOEKLER MANUFACTURING COMPANY

429 FOURTH AVENUE PITTSBURGH, PA.

THE REFRIGERATION LIBRARY—VOL. 3

MASTER SERVICE MANUAL

WHAT TO DO AND HOW TO DO IT for all types of household systems

BUSINESS NEWS PUBLISHING CO. PUBLISHERS OF ELECTRIC REFRIGERATION NEWS

The Master Service Manual (\$3.00 per copy) includes the necessary instructions for servicing all the fundamental types of household systems. Detailed instructions for the servicing of more than a dozen "orphan makes" are also included. Off the press this month.

The Refrigeration and Air Conditioning Specifications Book (\$2.00 per copy) will contain detailed comparative data which every dealer, salesman, and service man has been wanting. To be published March 1, 1936.

Combination Price for Both Books, \$5.00

THE REFRIGERATION LIBRARY—VOLUME 4

REFRIGERATION and Air Conditioning SPECIFICATIONS

For ALL MODELS and MAKES HOUSEHOLD and COMMERCIAL Including New Designs for 1936

BUSINESS NEWS PUBLISHING CO. PUBLISHERS OF ELECTRIC REFRIGERATION NEWS



THE ONLY PISTON RING DESIGNED & DEVELOPED Exclusively for Refrigeration

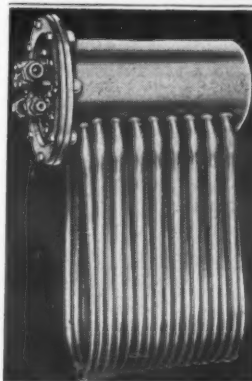


The Ring with a bearing face. A bearing for the ring against the cylinder wall.

Longer Life Less Friction Better Seal No Scuffing Burnishing Cylinder

DEALERS — JOBBERS — SERVICE MEN

Write for Details—SKINNER CHUCK CO., NEW BRITAIN, CONN.



STANGARD STANDS SUPREME

...in the fine art of recalibration of float valves and the silver soldering of evaporation coils... for all makes of Ice Cream Cabinets.

WE MANUFACTURE AND REPLACE... Monel Tops Enamel Panels... Tanks Rims and Rim Sleeves... all other parts for all make cabinets.

STANGARD PRODUCTS

A Division of Standard Body Corp.

430 E. 104th Street, New York

Write for Details

BOUND VOLUMES

Each of the following volumes contains all weekly issues of Electric Refrigeration News issued during a period of four months. Stiff paper board covers.

Vol. 8—Jan. 4 to April 26, 1933. (Serial Nos. 198 to 214.)
Vol. 9—May 3 to Aug. 30, 1933. (Serial Nos. 215 to 232.)
Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)
Vol. 13—Sept. 5 to Dec. 26, 1934. (Serial Nos. 285 to 301.)
Vol. 14—Jan. 2 to April 24, 1935. (Serial Nos. 302 to 318.)
Vol. 15—May 1 to Aug. 25, 1935. (Serial Nos. 319 to 336.)
Vol. 16—Sept. 4 to Dec. 25, 1935. (Serial Nos. 337 to 353.)

Price \$3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.

Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

Domestic ... Commercial ... Air Conditioning

REFRIGERATION PARTS FOR ALL MAKES

100% WHOLESALE "We Protect the Dealer"

The Harry Alter Co.

Main Office and Warehouse 1728 So. Michigan Ave., CHICAGO, ILL., U.S.A.

Send for Our Big Bargain Catalog